



**Emission Test Report
Particulate and Metals Emissions
Behr Iron & Metal - Rockford, Illinois
Site ID No.: P201030AB**

January 19, 2016

**APPENDIX C
PARTICULATE MATTER AND
TRACE METAL EMISSIONS TEST REPORT
NORTHWEST BAGHOUSE
Mostardi Plat Environmental Services**

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Particulate Matter and Trace Metal Emissions Test Report

For: RK & Associates, Inc.
At: Behr Iron & Metal
Rockford Facility
Northwest Baghouse System
Rockford, Illinois
Report No. M154005A
October 6, 2015





**Particulate Matter and Trace Metal Emissions
Test Report**

**For: RK & Associates, Inc.
At: Behr Iron & Metal
Rockford Facility
Northwest Baghouse System
Rockford, Illinois
October 6, 2015**

**Report Submittal Date
January 19, 2016**

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1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a particulate matter and trace metals emissions test program for Behr Iron & Metal at their Rockford facility on the Northwest Baghouse system in Rockford, Illinois on October 6, 2015. This report summarizes the results of the test program and test methods used.

The test locations, test date, and test parameters are summarized below.

TEST INFORMATION		
Test Locations	Test Date	Test Parameters
Foundry Sand Separator	October 6, 2015	Filterable Particulate Matter (FPM), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Manganese (Mn), Nickel (Ni), Selenium (Se), Silver (Ag), and Zinc (Zn)
Northwest Baghouse Gas Cooler Inlet		FPM, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Se, Ag, and Zn
Northwest Baghouse Outlet		FPM, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Se, Ag, Zn, and Opacity

The purpose of the test program was to determine FPM and metals emissions in the Northwest Baghouse. Selected results of the test program are summarized below. A complete summary of emission test results follows the narrative portion of this report.

TEST RESULTS SUMMARY		
Test Location	Test Parameter	Emission Rate, lb/hr
Foundry Sand Separator	FPM	4.359
	Sb	0.000604
	As	0.000031
	Ba	0.000286
	Be	< 0.000002
	Cd	0.000031
	Cr	0.0002
	Co	0.0001
	Cu	0.0580
	Pb	0.0482
	Mn	0.0018
	Ni	0.0008
	Se	< 0.00005
	Ag	0.00003
	Zn	0.0219

TEST RESULTS SUMMARY		
Test Location	Test Parameter	Emission Rate, lb/hr
Northwest Baghouse Gas Cooler Inlet	FPM	0.429
	Sb	0.001704
	As	0.000875
	Ba	< 0.000632
	Be	< 0.000010
	Cd	0.000061
	Cr	0.0007
	Co	0.0005
	Cu	0.0106
	Pb	0.0419
	Mn	0.0007
	Ni	0.0081
	Se	< 0.0001
	Ag	< 0.00002
	Zn	0.0060

Test Location	Test Parameter	Emission Rate, lb/hr
Northwest Baghouse Outlet	FPM	0.254
	Sb	0.000494
	As	0.000445
	Ba	< 0.000145
	Be	< 0.000006
	Cd	0.000041
	Cr	0.0001
	Co	0.0002
	Cu	0.0061
	Pb	0.0126
	Mn	0.0003
	Ni	0.0010
	Se	< 0.0001
	Ag	< 0.00001
	Zn	0.0053
	Opacity	0.00%

The Stationary Source Audit Sample Program audit sample was obtained from ERA and submitted for analysis to Maxxam Analytical. The results of the audit samples were compared to the assigned value by ERA and found to be acceptable. The audit sample results and evaluation is appended to this report

The identifications of the individuals associated with the test program are summarized below.

TEST PERSONNEL INFORMATION		
Location	Address	Contact
Test Coordinator	RK & Associates, Inc. 2S631 Route 59, Suite B Warrenville, Illinois 60555	Mr. John Pinion Associate Engineer (630) 393-9000 x 208 jpinion@rka-inc.com
Test Facility	Behr Iron & Metal 1100 Seminary Street Rockford, Illinois 61104	Mr. Ron Coupar Environmental Manager (815) 987-2770 rcoupar@behrim.com
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Mark Peterson Project Manager (630) 993-2100 (phone) mpeterson@mp-mail.com

The test crew consisted of Messrs. B. Schuler, B. Tarra, D. Kossack, J. Howe, K. Johnson, M. Karum, M. Lipinski, M. Platt, N. Colangelo, S. Cleary and M. Peterson of Mostardi Platt.

2.0 TEST METHODOLOGY

Emission testing was conducted following the methods specified in 40CFR60, Appendix A. A schematic of the test section diagrams are found in Appendix A and schematics of the sampling trains used are included in Appendix B. Calculation nomenclature and sample calculations are included in Appendix C. Laboratory analysis data are found in Appendix D. Copies of electronic data for each test run are included in Appendix E and field data sheets are found in Appendix F.

The following methodologies were used during the test program:

Method 1 Traverse Point Determination

Test measurement points were selected in accordance with Method 1. The characteristics of the measurement location are summarized below.

TEST POINT INFORMATION					
Test Location	Location Diameters	Upstream Diameters	Downstream Diameters	Test Parameters	Number of Sampling Points
Foundry Sand Separator	16 Inches	>0.5	>2.0	FPM, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Se, Ag, Zn	24
Northwest Baghouse Gas Cooler Inlet	33 Inches	>0.5	>2.0		40
Northwest Baghouse Outlet	33 Inches	>0.5	>2.0		24

Absence of cyclonic flow tests were performed prior to testing at each location and each location met the minimum criteria.

Method 2 Volumetric Flowrate Determination

Gas velocity was measured following Method 2, for purposes of calculating volumetric flow rate and particulate and trace metal emission rates on a lb/hr basis. An S-type pitot tube, differential pressure gauge, thermocouple and temperature readout were used to determine gas velocity at each sample point. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix G.

Method 3A/3 Oxygen (O₂)/Carbon Dioxide (CO₂) Determination

Flue gas molecular weight was determined in accordance with Method 3A during the first test run. Servomex analyzers were used to determine stack gas oxygen and carbon dioxide content and, by difference, nitrogen content. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix G and copies of the gas cylinder certifications are found in Appendix H. For all additional test runs the flue gas molecular weight was determined in accordance with Method 3. A Fyrite analyzer was used to determine stack gas oxygen and carbon dioxide content and, by difference, nitrogen content.

Method 5 Filterable Particulate Matter Determination

Flue gas filterable particulate matter concentrations and emission rates were determined in accordance with Method 5. The probe and filter housing were maintained at a temperature of 248°F +/- 25°F. An Environmental Supply Company, Inc. sampling train was used to sample flue gas at an isokinetic rate. Four impingers were utilized, the first two each contained 100 ml of 0.1N Nitric Peroxide (N₂O₂), the third remained empty, and the fourth contained approximately 200 grams of silica gel. The impingers were weighed prior to and after each test run in order to determine moisture content of the stack gas. A minimum of 60 dry standard cubic feet was sampled for each run.

Particulate matter in the sample probe was recovered utilizing acetone; three passes of the probe brush through the entire probe was performed, followed by a visual inspection of the acetone exiting the probe. The acetone solution exiting the probe was clear, and therefore the wash was considered complete. The nozzle was then removed from the probe and cleaned in a similar manner, utilizing an appropriately sized nozzle brush. The filter and filter housing were recovered in a clean area. The filter housing was washed a minimum of three times with acetone and inspected for cleanliness, and the filter was placed in its corresponding petri dish. The acetone wash and the filter were labeled and marked, then analyzed at the Mostardi Platt Laboratory by Mostardi Platt personnel in accordance with the Method. All sample data analysis, are found in Appendix E. All of the equipment used is calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix G.

Method 29 Trace Metals Determination

Flue gas metals concentrations and emission rates were determined in accordance with Method 29 in conjunction with the Method 5 sampling. An Environmental Supply Company, Inc. sampling train was used to sample stack gas, in the manner specified in the Method. Analyses of the samples collected were conducted by Maxxam. Samples were analyzed for the following metals, using Inductively Coupled Argon Plasma emission spectroscopy (ICP): Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Selenium, Silver, and Zinc. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data is presented in the Appendix G.

Method 9 Visual Emission Determination

Visible emissions were determined in accordance with Method 9. Visible emissions observations were conducted and recorded by M. Platt, who is a certified visual emissions observer. A copy of M. Platt's certification is presented in the Appendix I.

3.0 TEST RESULT SUMMARIES

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Test Method: 5/29

	Source Condition	Normal	Normal	Normal	
	Date	10/6/15	10/6/15	10/6/15	
	Start Time	11:40	14:40	17:40	
	End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average	
Stack Conditions					
Average Gas Temperature, °F	67.2	66.5	50.3	61.3	
Flue Gas Moisture, percent by volume	1.2%	1.2%	1.3%	1.2%	
Average Flue Pressure, in. Hg	29.25	29.25	29.25	29.25	
Gas Sample Volume, dscf	97.410	101.603	86.208	95.074	
Average Gas Velocity, ft/sec	26.842	27.603	26.149	26.865	
Gas Volumetric Flow Rate, acfm	2,249	2,312	2,191	2,251	
Gas Volumetric Flow Rate, dscfm	2,176	2,241	2,187	2,201	
Gas Volumetric Flow Rate, scfm	2,202	2,267	2,216	2,228	
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0	
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9	
Isokinetic Variance	99.4	100.7	93.5	97.9	
Filterable Particulate Matter (Method 5)					
grams collected	2.0658	1.3700	0.8877	1.4412	
grains/acf	0.3167	0.2016	0.1586	0.2256	
grains/dscf	0.3272	0.2081	0.1589	0.2314	
lb/hr	6.103	3.997	2.978	4.359	

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Foundry Sand Separator
Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:40	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	67.2	66.5	50.3	61.3
Flue Gas Moisture, percent by volume	1.2%	1.2%	1.3%	1.2%
Average Flue Pressure, in. Hg	29.25	29.25	29.25	29.25
Gas Sample Volume, dscf	97.410	101.603	86.208	95.074
Average Gas Velocity, ft/sec	26.842	27.603	26.149	26.865
Gas Volumetric Flow Rate, acfm	2,249	2,312	2,191	2,251
Gas Volumetric Flow Rate, dscfm	2,176	2,241	2,187	2,201
Gas Volumetric Flow Rate, scfm	2,202	2,267	2,216	2,228
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Isokinetic Variance	99.4	100.7	93.5	97.9
Antimony (Sb) Emissions				
ug of sample collected	241.00	219.35	137.00	199.12
ppb	17.25	15.05	11.08	14.46
ug/dscm	87.37	76.24	56.12	73.24
lb/hr	0.000712	0.000640	0.000460	0.000604
Arsenic (As) Emissions				
ug of sample collected	12.00	11.80	7.30	10.37
ppb	1.40	1.32	0.96	1.22
ug/dscm	4.35	4.10	2.99	3.81
lb/hr	0.000035	0.000034	0.000024	0.000031
Barium (Ba) Emissions				
ug of sample collected	109.90	105.50	67.30	94.23
ppb	6.97	6.42	4.83	6.07
ug/dscm	39.84	36.67	27.57	34.69
lb/hr	0.000325	0.000308	0.000226	0.000286
Beryllium (Be) Emissions				
ug of sample collected	≤ 0.55	≤ 0.55	≤ 0.55	≤ 0.55
ppb	≤ 0.53	≤ 0.51	≤ 0.60	≤ 0.55
ug/dscm	≤ 0.20	≤ 0.19	≤ 0.23	≤ 0.21
lb/hr	≤ 0.000002	≤ 0.000002	≤ 0.000002	≤ 0.000002
Cadmium (Cd) Emissions				
ug of sample collected	10.85	9.44	9.95	10.08
ppb	0.84	0.70	0.87	0.81
ug/dscm	3.93	3.28	4.08	3.76
lb/hr	0.000032	0.000028	0.000033	0.000031

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:40	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	67.2	66.5	50.3	61.3
Flue Gas Moisture, percent by volume	1.2%	1.2%	1.3%	1.2%
Average Flue Pressure, in. Hg	29.25	29.25	29.25	29.25
Gas Sample Volume, dscf	97.410	101.603	86.208	95.074
Average Gas Velocity, ft/sec	26.842	27.603	26.149	26.865
Gas Volumetric Flow Rate, acfm	2,249	2,312	2,191	2,251
Gas Volumetric Flow Rate, dscfm	2,176	2,241	2,187	2,201
Gas Volumetric Flow Rate, scfm	2,202	2,267	2,216	2,228
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Isokinetic Variance	99.4	100.7	93.5	97.9
Chromium (Cr) Emissions				
ug of sample collected	73.75	52.05	42.39	56.06
ppb	12.36	8.36	8.03	9.58
ug/dscm	26.74	18.09	17.36	20.73
lb/hr	0.0002	0.0002	0.0001	0.0002
Cobalt (Co) Emissions				
ug of sample collected	57.96	40.03	24.38	40.79
ppb	8.57	5.68	4.07	6.11
ug/dscm	21.01	13.91	9.99	14.97
lb/hr	0.0002	0.0001	0.0001	0.0001
Copper (Cu) Emissions				
ug of sample collected	30602.20	17002.80	10105.30	19236.77
ppb	4195.89	2235.06	1565.58	2665.51
ug/dscm	11094.41	5909.75	4139.58	7047.91
lb/hr	0.0904	0.0496	0.0339	0.0580
Lead (Pb) Emissions				
ug of sample collected	20901.22	16302.75	10500.84	15901.60
ppb	879.00	657.32	499.00	678.44
ug/dscm	7577.45	5666.43	4301.61	5848.50
lb/hr	0.0618	0.0476	0.0352	0.0482
Manganese (Mn) Emissions				
ug of sample collected	825.59	581.19	359.99	588.92
ppb	130.94	88.37	64.51	94.61
ug/dscm	299.31	202.01	147.47	216.26
lb/hr	0.0024	0.0017	0.0012	0.0018

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Foundry Sand Separator
Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:40	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	67.2	66.5	50.3	61.3
Flue Gas Moisture, percent by volume	1.2%	1.2%	1.3%	1.2%
Average Flue Pressure, in. Hg	29.25	29.25	29.25	29.25
Gas Sample Volume, dscf	97.410	101.603	86.208	95.074
Average Gas Velocity, ft/sec	26.842	27.603	26.149	26.865
Gas Volumetric Flow Rate, acfm	2,249	2,312	2,191	2,251
Gas Volumetric Flow Rate, dscfm	2,176	2,241	2,187	2,201
Gas Volumetric Flow Rate, scfm	2,202	2,267	2,216	2,228
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Isokinetic Variance	99.4	100.7	93.5	97.9
Nickel (Ni) Emissions				
ug of sample collected	332.80	229.84	176.46	246.37
ppb	49.39	32.70	29.59	37.23
ug/dscm	120.65	79.89	72.29	90.94
lb/hr	0.0010	0.0007	0.0006	0.0008
Selenium (Se) Emissions				
ug of sample collected ≤	5.65 ≤	17.70 ≤	5.50 ≤	9.62 ≤
ppb ≤	0.62 ≤	1.87 ≤	0.69 ≤	1.06 ≤
ug/dscm ≤	2.05 ≤	6.15 ≤	2.25 ≤	3.48 ≤
lb/hr ≤	0.00002 ≤	0.0001 ≤	0.00002 ≤	0.00005 ≤
Silver (Ag) Emissions				
ug of sample collected	11.96	8.12	9.60	9.89
ppb	0.97	0.63	0.88	0.82
ug/dscm	4.34	2.82	3.93	3.70
lb/hr	0.00004	0.00002	0.00003	0.00003
Zinc (Zn) Emissions				
ug of sample collected	8991.90	7762.40	4913.10	7222.47
ppb	1198.56	991.98	739.98	976.84
ug/dscm	3259.89	2698.02	2012.62	2656.84
lb/hr	0.0266	0.0226	0.0165	0.0219

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Northwest Baghouse Gas Cooler Inlet
 Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:35	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	94.2	93.6	101.4	97.5
Flue Gas Moisture, percent by volume	1.4%	1.3%	1.7%	1.5%
Average Flue Pressure, in. Hg	29.35	29.35	29.35	29.35
Gas Sample Volume, dscf	76.881	90.097	91.445	90.771
Average Gas Velocity, ft/sec	40.889	41.193	43.201	42.197
Gas Volumetric Flow Rate, acfm	14,572	14,680	15,396	15,038
Gas Volumetric Flow Rate, dscfm	13,432	13,563	13,971	13,767
Gas Volumetric Flow Rate, scfm	13,621	13,736	14,206	13,971
Average %CO ₂ by volume, dry basis	0.1	0.1	0.1	0.1
Average %O ₂ by volume, dry basis	20.8	20.8	20.8	20.8
Isokinetic Variance	94.9	103.0	101.5	102.3
Filterable Particulate Matter (Method 5)				
grams collected	0.0415	0.0287	0.0142	0.0214
grains/acf	0.0077	0.0045	0.0022	0.0034
grains/dscf	0.0083	0.0049	0.0024	0.0037
lb/hr	0.959	0.571	0.287	0.429

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Northwest Baghouse Gas Cooler Inlet
Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:35	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	94.2	93.6	101.4	96.4
Flue Gas Moisture, percent by volume	1.4%	1.3%	1.7%	1.5%
Average Flue Pressure, in. Hg	29.35	29.35	29.35	29.35
Gas Sample Volume, dscf	76.881	90.097	91.445	86.141
Average Gas Velocity, ft/sec	40.889	41.193	43.201	41.761
Gas Volumetric Flow Rate, acfm	14,572	14,680	15,396	14,883
Gas Volumetric Flow Rate, dscfm	13,432	13,563	13,971	13,655
Gas Volumetric Flow Rate, scfm	13,621	13,736	14,206	13,854
Average %CO ₂ by volume, dry basis	0.1	0.1	0.1	0.1
Average %O ₂ by volume, dry basis	20.8	20.8	20.8	20.8
Isokinetic Variance	94.9	103.0	101.5	99.8
Antimony (Sb) Emissions				
ug of sample collected	150.00	49.20	33.00	77.40
ppb	13.60	3.81	2.52	6.64
ug/dscm	68.90	19.28	12.74	33.64
lb/hr	0.003466	0.000980	0.000667	0.001704
Arsenic (As) Emissions				
ug of sample collected	19.12	87.40	21.87	42.80
ppb	2.82	10.99	2.71	5.51
ug/dscm	8.78	34.26	8.45	17.16
lb/hr	0.000442	0.001740	0.000442	0.000875
Barium (Ba) Emissions				
ug of sample collected	54.40	≤ 16.70	15.20	≤ 28.77
ppb	4.37	≤ 1.15	1.03	≤ 2.18
ug/dscm	24.99	≤ 6.55	5.87	≤ 12.47
lb/hr	0.001257	≤ 0.000333	0.000307	≤ 0.000632
Beryllium (Be) Emissions				
ug of sample collected	≤ 0.55	≤ 0.55	≤ 0.25	≤ 0.45
ppb	≤ 0.67	≤ 0.58	≤ 0.26	≤ 0.50
ug/dscm	≤ 0.25	≤ 0.22	≤ 0.10	≤ 0.19
lb/hr	≤ 0.000013	≤ 0.000011	≤ 0.000005	≤ 0.000010
Cadmium (Cd) Emissions				
ug of sample collected	1.51	4.21	3.16	2.96
ppb	0.15	0.35	0.26	0.25
ug/dscm	0.69	1.65	1.22	1.19
lb/hr	0.000035	0.000084	0.000064	0.000061

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Northwest Baghouse Gas Cooler Inlet
 Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:35	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	94.2	93.6	101.4	96.4
Flue Gas Moisture, percent by volume	1.4%	1.3%	1.7%	1.5%
Average Flue Pressure, in. Hg	29.35	29.35	29.35	29.35
Gas Sample Volume, dscf	76.881	90.097	91.445	86.141
Average Gas Velocity, ft/sec	40.889	41.193	43.201	41.761
Gas Volumetric Flow Rate, acfm	14,572	14,680	15,396	14,883
Gas Volumetric Flow Rate, dscfm	13,432	13,563	13,971	13,655
Gas Volumetric Flow Rate, scfm	13,621	13,736	14,206	13,854
Average %CO ₂ by volume, dry basis	0.1	0.1	0.1	0.1
Average %O ₂ by volume, dry basis	20.8	20.8	20.8	20.8
Isokinetic Variance	94.9	103.0	101.5	99.8
Chromium (Cr) Emissions				
ug of sample collected	46.22	33.35	19.71	33.09
ppb	9.82	6.04	3.52	6.46
ug/dscm	21.23	13.07	7.61	13.97
lb/hr	0.0011	0.0007	0.0004	0.0007
Cobalt (Co) Emissions				
ug of sample collected	44.86	21.05	11.78	25.90
ppb	8.41	3.37	1.86	4.54
ug/dscm	20.61	8.25	4.55	11.14
lb/hr	0.0010	0.0004	0.0002	0.0005
Copper (Cu) Emissions				
ug of sample collected	1044.10	231.90	157.80	477.93
ppb	181.38	34.38	23.05	79.60
ug/dscm	479.60	90.90	60.94	210.48
lb/hr	0.0241	0.0046	0.0032	0.0106
Lead (Pb) Emissions				
ug of sample collected	4271.74	810.67	536.71	1873.04
ppb	227.62	36.86	24.04	96.17
ug/dscm	1962.19	317.75	207.27	829.07
lb/hr	0.0987	0.0161	0.0108	0.0419
Manganese (Mn) Emissions				
ug of sample collected	65.61	17.87	12.01	31.83
ppb	13.18	3.06	2.03	6.092
ug/dscm	30.14	7.00	4.64	13.93
lb/hr	0.0015	0.0004	0.0002	0.0007

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Northwest Baghouse Gas Cooler Inlet
Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:35	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	94.2	93.6	101.4	96.4
Flue Gas Moisture, percent by volume	1.4%	1.3%	1.7%	1.5%
Average Flue Pressure, in. Hg	29.35	29.35	29.35	29.35
Gas Sample Volume, dscf	76.881	90.097	91.445	86.141
Average Gas Velocity, ft/sec	40.889	41.193	43.201	41.761
Gas Volumetric Flow Rate, acfm	14,572	14,680	15,396	14,883
Gas Volumetric Flow Rate, dscfm	13,432	13,563	13,971	13,655
Gas Volumetric Flow Rate, scfm	13,621	13,736	14,206	13,854
Average %CO ₂ by volume, dry basis	0.1	0.1	0.1	0.1
Average %O ₂ by volume, dry basis	20.8	20.8	20.8	20.8
Isokinetic Variance	94.9	103.0	101.5	99.8
Nickel (Ni) Emissions				
ug of sample collected	466.46	469.58	202.95	379.66
ppb	87.72	75.35	32.09	65.05
ug/dscm	214.26	184.06	78.38	158.90
lb/hr	0.0108	0.0094	0.0041	0.0081
Selenium (Se) Emissions				
ug of sample collected ≤	5.72	≤ 5.50	≤ 3.05	≤ 4.76
ppb ≤	0.80	≤ 0.66	≤ 0.36	≤ 0.61
ug/dscm ≤	2.63	≤ 2.16	≤ 1.18	≤ 1.99
lb/hr ≤	0.0001	≤ 0.0001	≤ 0.0001	≤ 0.0001
Silver (Ag) Emissions				
ug of sample collected ≤	1.10	≤ 1.10	≤ 0.50	≤ 0.90
ppb ≤	0.11	≤ 0.10	≤ 0.04	≤ 0.084
ug/dscm ≤	0.51	≤ 0.43	≤ 0.19	≤ 0.38
lb/hr ≤	0.00003	≤ 0.00002	≤ 0.00001	≤ 0.00002
Zinc (Zn) Emissions				
ug of sample collected	547.90	158.30	110.60	272.27
ppb	92.53	22.81	15.70	43.68
ug/dscm	251.67	62.05	42.71	118.81
lb/hr	0.0127	0.0032	0.0022	0.0060

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Northwest Baghouse Outlet Stack
 Test Method: 5/29

	Source Condition	Normal	Normal	Normal	
	Date	10/6/15	10/6/15	10/6/15	
	Start Time	11:40	14:40	17:35	
	End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average	
Stack Conditions					
Average Gas Temperature, °F	89.6	89.9	92.2	90.6	
Flue Gas Moisture, percent by volume	1.5%	1.5%	1.7%	1.6%	
Average Flue Pressure, in. Hg	29.25	29.25	29.25	29.25	
Gas Sample Volume, dscf	84.471	82.329	87.274	84.691	
Average Gas Velocity, ft/sec	43.866	42.516	44.844	43.742	
Gas Volumetric Flow Rate, acfm	15,633	15,152	15,981	15,589	
Gas Volumetric Flow Rate, dscfm	14,459	14,013	14,690	14,387	
Gas Volumetric Flow Rate, scfm	14,684	14,224	14,940	14,616	
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0	
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9	
Isokinetic Variance	100.3	100.9	102.0	101.1	
Filterable Particulate Matter (Method 5)					
grams collected	0.0111	0.0113	0.0116	0.0113	
grains/acf	0.0019	0.0020	0.0019	0.0019	
grains/dscf	0.0020	0.0021	0.0021	0.0021	
lb/hr	0.251	0.254	0.258	0.254	

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Northwest Baghouse Outlet Stack
Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:35	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	89.6	89.9	92.2	90.6
Flue Gas Moisture, percent by volume	1.5%	1.5%	1.7%	1.6%
Average Flue Pressure, in. Hg	29.25	29.25	29.25	29.25
Gas Sample Volume, dscf	84.471	82.329	87.274	84.691
Average Gas Velocity, ft/sec	43.866	42.516	44.844	43.742
Gas Volumetric Flow Rate, acfm	15,633	15,152	15,981	15,589
Gas Volumetric Flow Rate, dscfm	14,459	14,013	14,690	14,387
Gas Volumetric Flow Rate, scfm	14,684	14,224	14,940	14,616
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Isokinetic Variance	100.3	100.9	102.0	101.1
Antimony (Sb) Emissions				
ug of sample collected	37.60	14.40	13.80	21.93
ppb	3.10	1.22	1.10	1.81
ug/dscm	15.72	6.18	5.58	9.16
lb/hr	0.000851	0.000324	0.000307	0.000494
Arsenic (As) Emissions				
ug of sample collected	34.37	13.47	11.35	19.73
ppb	4.61	1.85	1.47	2.65
ug/dscm	14.37	5.78	4.59	8.25
lb/hr	0.000778	0.000303	0.000253	0.000445
Barium (Ba) Emissions				
ug of sample collected	9.00	5.70	≤ 4.60	≤ 6.43
ppb	0.66	0.43	≤ 0.33	≤ 0.47
ug/dscm	3.76	2.44	≤ 1.86	≤ 2.69
lb/hr	0.000204	0.000128	≤ 0.000102	≤ 0.000145
Beryllium (Be) Emissions				
ug of sample collected	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
ppb	≤ 0.28	≤ 0.29	≤ 0.27	≤ 0.28
ug/dscm	≤ 0.10	≤ 0.11	≤ 0.10	≤ 0.10
lb/hr	≤ 0.000006	≤ 0.000006	≤ 0.000006	≤ 0.000006
Cadmium (Cd) Emissions				
ug of sample collected	1.06	1.62	2.79	1.83
ppb	0.10	0.15	0.24	0.16
ug/dscm	0.44	0.70	1.13	0.76
lb/hr	0.000024	0.000037	0.000062	0.000041

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Northwest Baghouse Outlet Stack
 Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:35	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	89.6	89.9	92.2	90.6
Flue Gas Moisture, percent by volume	1.5%	1.5%	1.7%	1.6%
Average Flue Pressure, in. Hg	29.25	29.25	29.25	29.25
Gas Sample Volume, dscf	84.471	82.329	87.274	84.691
Average Gas Velocity, ft/sec	43.866	42.516	44.844	43.742
Gas Volumetric Flow Rate, acfm	15,633	15,152	15,981	15,589
Gas Volumetric Flow Rate, dscfm	14,459	14,013	14,690	14,387
Gas Volumetric Flow Rate, scfm	14,684	14,224	14,940	14,616
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Isokinetic Variance	100.3	100.9	102.0	101.1
Chromium (Cr) Emissions				
ug of sample collected	10.28	5.08	4.54	6.63
ppb	1.99	1.01	0.85	1.28
ug/dscm	4.30	2.18	1.84	2.77
lb/hr	0.0002	0.0001	0.0001	0.0001
Cobalt (Co) Emissions				
ug of sample collected	17.97	6.93	6.61	10.50
ppb	3.06	1.21	1.09	1.79
ug/dscm	7.51	2.97	2.68	4.39
lb/hr	0.0004	0.0002	0.0001	0.0002
Copper (Cu) Emissions				
ug of sample collected	349.60	186.00	284.30	273.30
ppb	55.28	30.17	43.51	42.99
ug/dscm	146.16	79.78	115.04	113.66
lb/hr	0.0079	0.0042	0.0063	0.0061
Lead (Pb) Emissions				
ug of sample collected	796.80	409.53	470.17	558.83
ppb	38.64	20.38	22.07	27.03
ug/dscm	333.12	175.67	190.25	233.01
lb/hr	0.0180	0.0092	0.0105	0.0126
Manganese (Mn) Emissions				
ug of sample collected	15.54	7.74	9.59	10.96
ppb	2.84	1.45	1.70	2.00
ug/dscm	6.50	3.32	3.88	4.57
lb/hr	0.0004	0.0002	0.0002	0.0003

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Northwest Baghouse Outlet Stack
Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/6/15	10/6/15	10/6/15	
Start Time	11:40	14:40	17:35	
End Time	13:52	16:52	19:51	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	89.6	89.9	92.2	90.6
Flue Gas Moisture, percent by volume	1.5%	1.5%	1.7%	1.6%
Average Flue Pressure, in. Hg	29.25	29.25	29.25	29.25
Gas Sample Volume, dscf	84.471	82.329	87.274	84.691
Average Gas Velocity, ft/sec	43.866	42.516	44.844	43.742
Gas Volumetric Flow Rate, acfm	15,633	15,152	15,981	15,589
Gas Volumetric Flow Rate, dscfm	14,459	14,013	14,690	14,387
Gas Volumetric Flow Rate, scfm	14,684	14,224	14,940	14,616
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Isokinetic Variance	100.3	100.9	102.0	101.1
Nickel (Ni) Emissions				
ug of sample collected	72.04	29.98	29.21	43.74
ppb	12.33	5.26	4.84	7.48
ug/dscm	30.12	12.86	11.82	18.27
lb/hr	0.0016	0.0007	0.0007	0.0010
Selenium (Se) Emissions				
ug of sample collected ≤	2.50	≤ 2.50	≤ 2.50	≤ 2.50
ppb ≤	0.32	≤ 0.33	≤ 0.31	≤ 0.32
ug/dscm ≤	1.05	≤ 1.07	≤ 1.01	≤ 1.04
lb/hr ≤	0.0001	≤ 0.0001	≤ 0.0001	≤ 0.0001
Silver (Ag) Emissions				
ug of sample collected ≤	0.73	≤ 0.53	≤ 0.50	≤ 0.59
ppb ≤	0.07	≤ 0.05	≤ 0.05	≤ 0.055
ug/dscm ≤	0.31	≤ 0.23	≤ 0.20	≤ 0.25
lb/hr ≤	0.00002	≤ 0.00001	≤ 0.00001	≤ 0.00001
Zinc (Zn) Emissions				
ug of sample collected	357.70	173.20	174.80	235.23
ppb	54.98	27.32	26.01	36.10
ug/dscm	149.54	74.29	70.73	98.19
lb/hr	0.0081	0.0039	0.0039	0.0053

4.0 CERTIFICATION

MOSTARDI PLATT is pleased to have been of service to RK & Associates, Inc. If you have any questions regarding this test report, please do not hesitate to contact us at 630-993-2100.

CERTIFICATION

As project manager, I hereby certify that this test report represents a true and accurate summary of emissions test results and the methodologies employed to obtain those results, and the test program was performed in accordance with the methods specified in this test report.

MOSTARDI PLATT



Mark E. Peterson

Program Manager



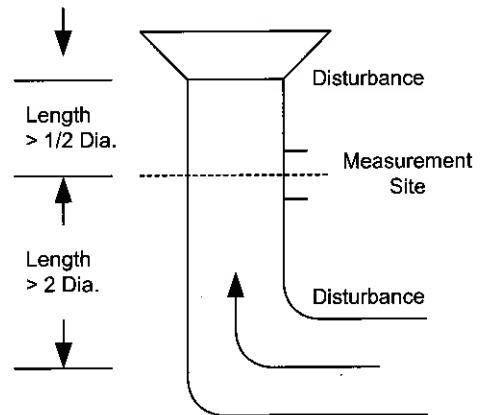
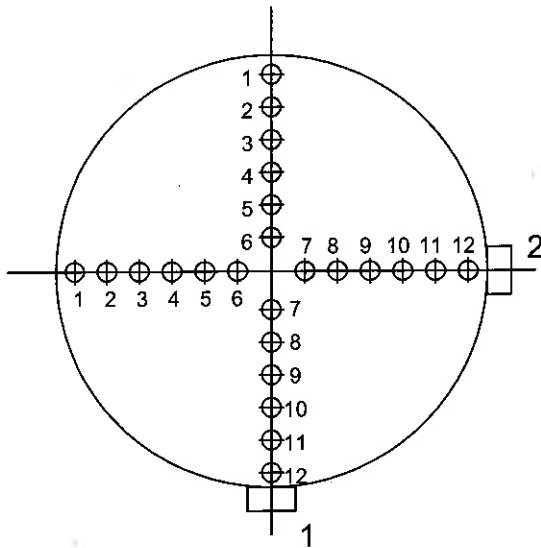
Eric L. Ehlers

Quality Assurance

APPENDICES

Appendix A - Test Section Diagrams

EQUAL AREA TRAVERSE FOR ROUND DUCTS



Job: Behr Iron & Metal

Date: October 6, 2015

Test Location: Foundry Sand Separator

Duct Diameter: 16"

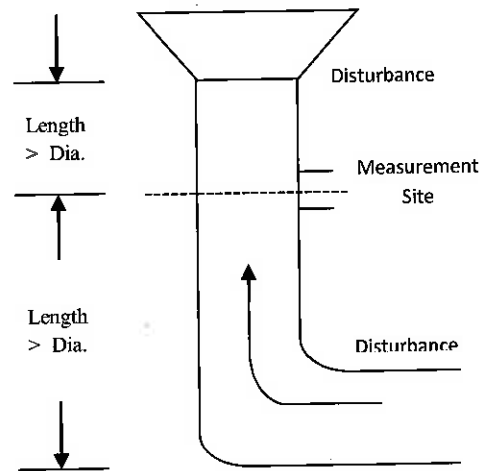
Duct Area: 1.396

No. Points Across Diameter: 12

No. of Ports: 2

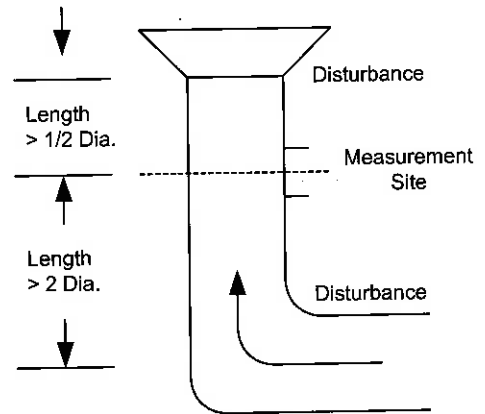
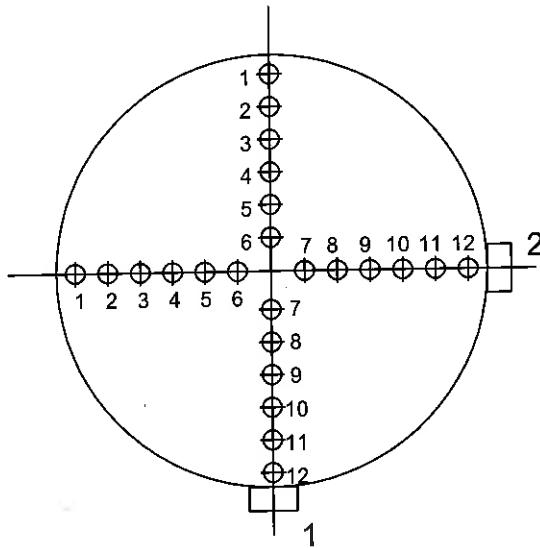
Port Length: Hole in Duct

The diagram shows a circle with a horizontal and vertical axis intersecting at the center. There are 20 small circles, numbered 1 through 20, arranged along these axes. The vertical axis has 10 circles, numbered 1 to 10 from top to center, and 11 to 20 from center to bottom. The horizontal axis has 10 circles, numbered 1 to 10 from left to center, and 11 to 20 from center to right. Four square markers are positioned at the ends of the axes: at the top, bottom, left, and right. The bottom square marker is labeled with a bold '1' below it. The right square marker is labeled with a bold '2' to its right.



Port Length
(inches): 6"

EQUAL AREA TRAVERSE FOR ROUND DUCTS



Job: Behr Iron & Metal

Date: October 6, 2015

Test Location: Northwest Baghouse Outlet

Duct Diameter: 33"

Duct Area: 5.940

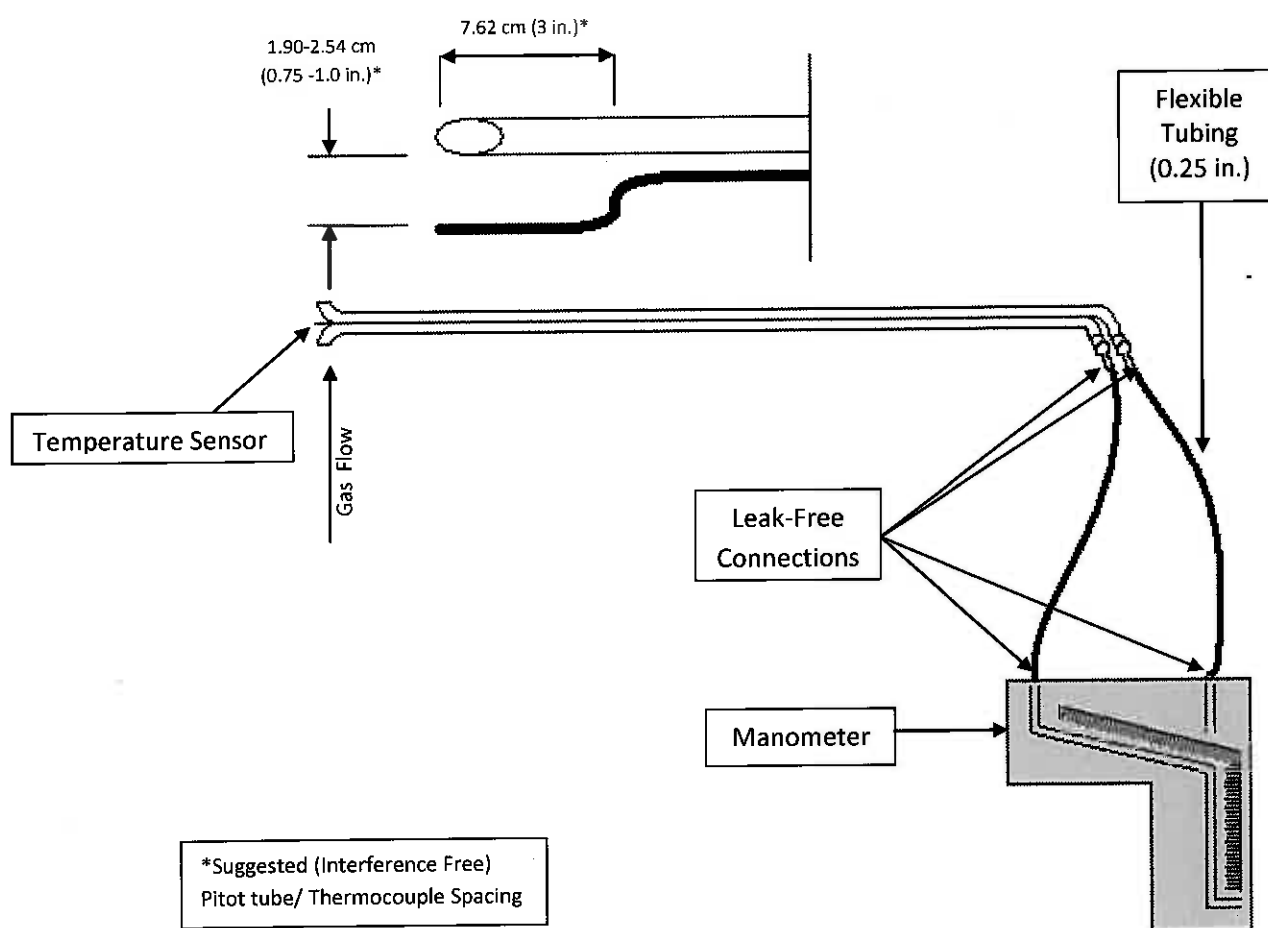
No. Points Across Diameter: 12

No. of Ports: 2

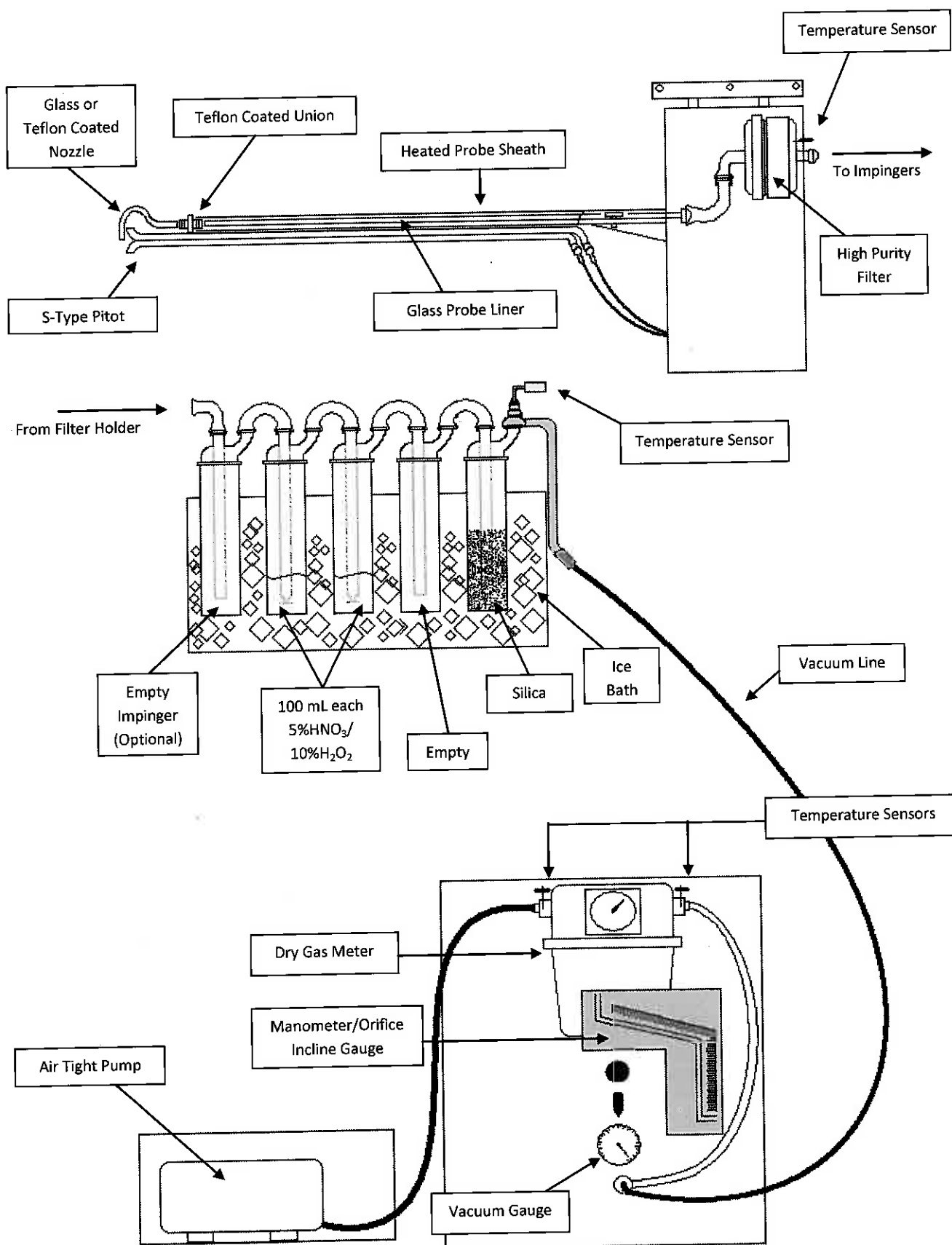
Port Length: 8"

Appendix B - Sample Train Diagrams

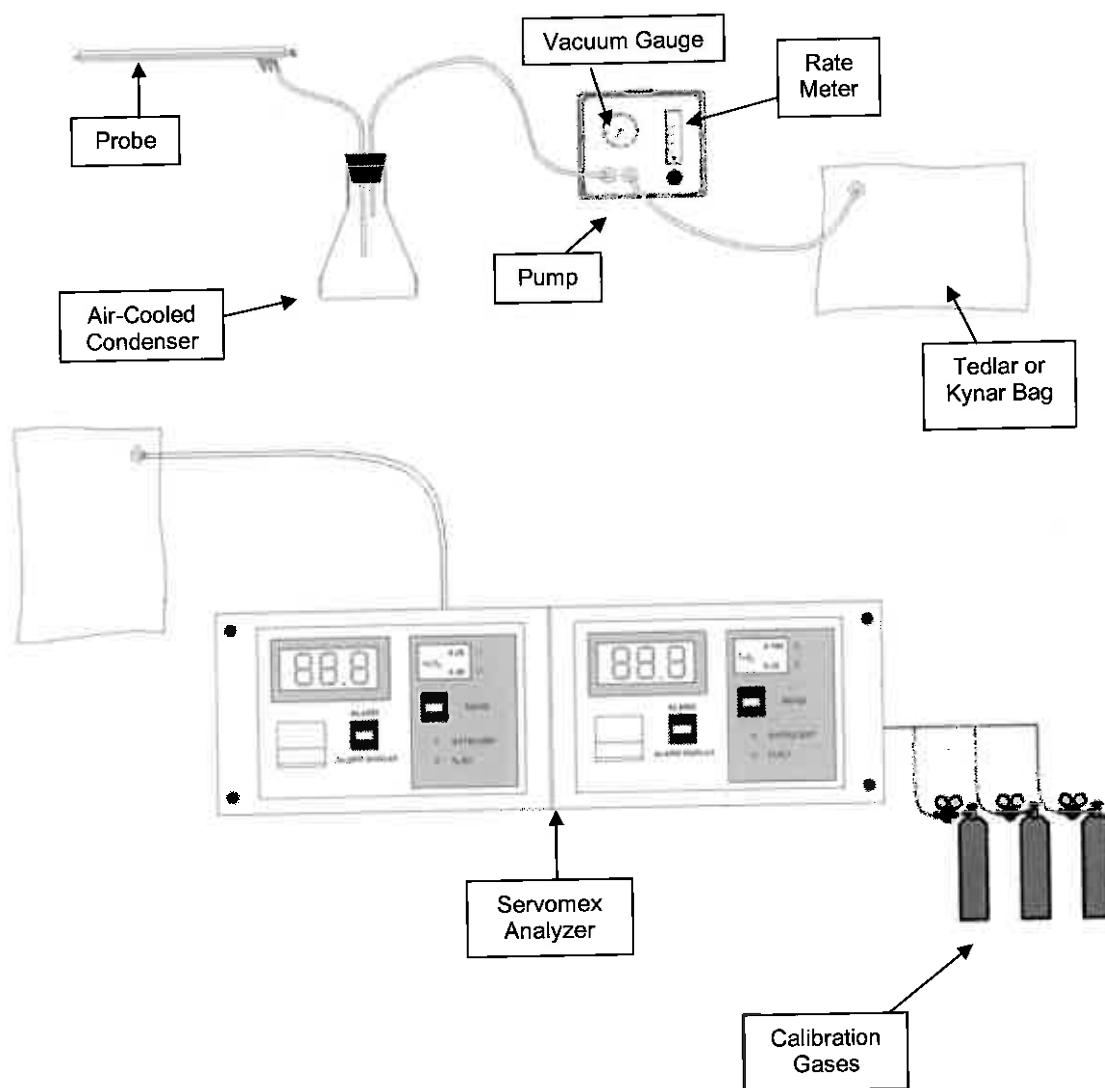
USEPA Method 2- Type S Pitot Tube Manometer Assembly



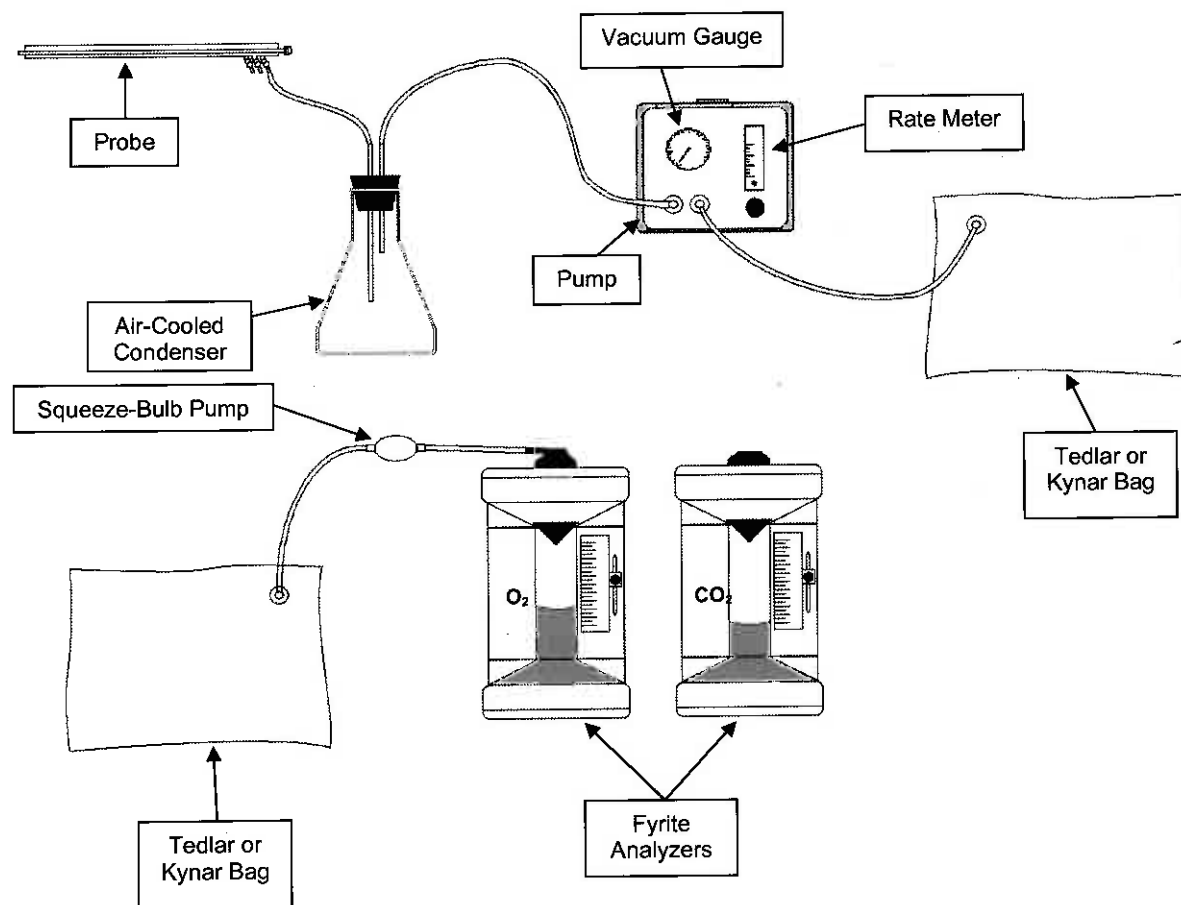
USEPA Method 29- Metals Sample Train Diagram



USEPA Method 3A - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing Tedlar Gas Bag



USEPA Method 3 - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing Fyrite Gas Analyzer



Appendix C - Calculation Nomenclature and Formulas

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Run: 1
 Date: 10/6/2015
 Method: 5/29
 Source Condition: Normal

Dry Molecular Weight

$$Md = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

$$\%CO_2 = \underline{0.0} \quad \%O_2 = \underline{20.9} \quad \%N_2 = \underline{79.1}$$

$$Md = \underline{28.836}$$

Wet Molecular Weight

$$Ms = Md \times (1 - Bws) + (18.0 \times Bws)$$

$$Md = \underline{28.836} \quad Bws = \underline{0.012}$$

$$Ms = \underline{28.708}$$

Meter Volume at Standard Conditions

$$Vm(std) = 17.647 \times Y \times Vm \times \frac{(Pbar + DH/13.6)}{Tm}$$

$$Y = \underline{1.003} \quad Vm = \underline{97.682} \quad Pbar = \underline{29.40}$$

$$DH = \underline{2.16} \quad Tm = \underline{524.6}$$

$$Vm(std) = \underline{97.410}$$

Volume of Water Vapor Condensed

$$Vw(std) = 0.0471 \times (\text{net } H_2O \text{ gain})$$

$$\text{Net } H_2O = \underline{24.7}$$

$$Vw(std) = \underline{1.163}$$

Moisture Content

$$Bws = \frac{Vwc(std)}{Vwc(std) + Vm(std)}$$

$$Vw(std) = \underline{1.163} \quad Vm(std) = \underline{97.410}$$

$$Bws = \underline{0.012} \quad 0.011592332$$

Client: **Rk & Associates, Inc.**
 Facility: **Behr Iron and Metal Rockford Facility**
 Test Location: **Foundry Sand Separator**
 Run: **1**
 Date: **10/6/2015**
 Method: **5/29**
 Source Condition: **Normal**

Average Duct Velocity

$$V_s = 85.49 \times C_p \times \sqrt{DP \text{ (avg)}} \times (T_s \text{ (avg)} / (P_s \times M_s))^{1/2}$$

$$C_p = \frac{0.840}{29.25} \quad T_s \text{ (avg)} = \frac{527.2}{28.708} \quad \sqrt{DP \text{ (avg)}} = 0.472$$

$$V_s = 26.842$$

Volumetric Flow Rate (Actual Basis)

$$Q = V_s \times A \times 60$$

$$V_s = 26.842 \quad A = 1.396$$

$$Q = 2,249$$

Volumetric Flow Rate (Standard Basis)

$$Q_{std} = 17.647 \times Q \times \frac{P_s}{T_s \text{ (avg)}}$$

$$Q = 2,249 \quad P_s = 29.25 \quad T_s \text{ (avg)} = 527.2$$

$$Q_{std} = 2,202$$

Volumetric Flow Rate (Standard Dry Basis)

$$Q_{std(dry)} = Q_{std} \times (1 - Bws)$$

$$Q_{std} = 2,202 \quad Bws = 0.012$$

$$Q_{std(dry)} = 2,176$$

Isokinetic Variation:

$$\%ISO = \frac{0.0945 \times T_s \times V_m(std)}{V_s \times \theta \times A_n \times P_s \times (1 - Bws)}$$

$$T_s = 527.2 \quad V_m(std) = 97.410 \quad V_s = 26.842$$

$$A_n = 0.0005241 \quad \theta = 120 \quad P_s = 29.25$$

$$Bws = 0.012$$

$$\%ISO = 99.4$$

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Foundry Sand Separator
Run: 1
Date: 10/6/2015
Method: 5/29
Source Condition: Normal

PM Concentration:

This example represents the filterable fraction. For other fractions, use the obtained mn for that particulate fraction.

$$Co = \frac{m_n \times 15.43}{Vm(std)}$$

$$m_n (g) = \underline{2.0658} \quad Vm(std) = \underline{97.410}$$

$$Co = \underline{0.3272} \text{ gr/dscf}$$

PM Emission Rate:

$$\text{Emission Rate lb/hr} = \frac{Co}{7,000} \times Qstd(dry) \times 60$$

$$Co = \underline{0.3272} \quad Qstd(dry) = \underline{2,176}$$

$$\text{Emission Rate lb/hr} = \underline{6.103} \text{ lb/hr}$$

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Run: 1
 Date: 10/6/2015
 Method: 5/29
 Source Condition: Normal

Dry Molecular Weight

$$M_d = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

$$\%CO_2 = \underline{0.0} \quad \%O_2 = \underline{20.9} \quad \%N_2 = \underline{79.1}$$

$$M_d = \underline{28.836}$$

Wet Molecular Weight

$$M_s = M_d \times (1 - B_{ws}) + (18.0 \times B_{ws})$$

$$M_d = \underline{28.836} \quad B_{ws} = \underline{0.012}$$

$$M_s = \underline{28.708}$$

Meter Volume at Standard Conditions

$$V_m(\text{std}) = 17.647 \times Y \times V_m \times \frac{(P_{\text{bar}} + DH/13.6)}{T_m}$$

$$Y = \underline{1.003} \quad V_m = \underline{97.682} \quad P_{\text{bar}} = \underline{29.4}$$

$$DH = \underline{2.2} \quad T_m = \underline{524.6}$$

$$V_m(\text{std}) = \underline{97.410}$$

Volume of Water Vapor Condensed

$$V_w(\text{std}) = 0.0471 \times (\text{net } H_2O \text{ gain})$$

$$\text{Net } H_2O = \underline{24.7}$$

$$V_w(\text{std}) = \underline{1.163}$$

Moisture Content

$$B_{ws} = \frac{V_{wc}(\text{std})}{V_{wc}(\text{std}) + V_m(\text{std})}$$

$$V_w(\text{std}) = \underline{1.163} \quad V_m(\text{std}) = \underline{97.410}$$

$$B_{ws} = \underline{0.012}$$

Average Duct Velocity

$$V_s = 85.49 \times C_p \times \text{Sqrt } DP(\text{avg}) \times (T_s(\text{avg}) / (P_s \times M_s))^{1/2}$$

$$C_p = \underline{0.840} \quad T_s(\text{avg}) = \underline{527.2} \quad \text{Sqrt } DP(\text{avg}) = \underline{0.472}$$

$$P_s = \underline{29.25} \quad M_s = \underline{28.708}$$

$$V_s = \underline{26.842}$$

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Run: 1
 Date: 10/6/2015
 Method: 5/29
 Source Condition: Normal

Volumetric Flow Rate (Actual Basis)

$$Q = V_s \times A \times 60$$

$$V_s = \underline{26.842} \quad A = \underline{1.396}$$

$$Q = \underline{2,249}$$

Volumetric Flow Rate (Standard Basis)

$$Q_{std} = 17.647 \times Q \times \frac{P_s}{T_s \text{ (avg)}}$$

$$Q = \underline{2,249} \quad P_s = \underline{29.25} \quad T_s \text{ (avg)} = \underline{527.2}$$

$$Q_{std} = \underline{2,202}$$

Volumetric Flow Rate (Standard Dry Basis)

$$Q_{std}(\text{dry}) = Q_{std} \times (1 - Bws)$$

$$Q_{std} = \underline{2,202} \quad Bws = \underline{0.012}$$

$$Q_{std}(\text{dry}) = \underline{2,176}$$

Isokinetic Variation:

$$\%ISO = \frac{0.0945 \times T_s \times Vm(\text{std})}{V_s \times \theta \times A_n \times P_s \times (1 - Bws)}$$

$$\begin{array}{ll}
 T_s = \underline{527.2} & Vm(\text{std}) = \underline{97.410} \\
 A_n = \underline{0.0005241} & \theta = \underline{120} \\
 Bws = \underline{0.012} &
 \end{array}$$

$$\begin{array}{ll}
 V_s = \underline{26.842} \\
 P_s = \underline{29.25}
 \end{array}$$

$$\%ISO = \underline{99.4}$$

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Run: 1
 Date: 10/6/2015
 Method: 5/29
 Source Condition: Normal

Antimony (Sb) Concentration:

$$\mu\text{g}/\text{m}^3 = \frac{\mu\text{g of Antimony (Sb)}}{\text{Vm(std)} \times 0.02832 \text{ m}^3/\text{ft}^3}$$

$$\mu\text{g} = \underline{241.00} \quad \text{Vm(std)} = \underline{97.410}$$

$$\mu\text{g}/\text{m}^3 = \underline{87.37}$$

Antimony (Sb) Emission Rate:

$$\text{lb of Antimony (Sb)} = \frac{\mu\text{g of sample} \times 10^{-6} \text{ grams}/\mu\text{g}}{453.6 \text{ grams/lb}}$$

$$\text{lb of Antimony (Sb)} = \underline{5.31\text{E-}07} \quad \text{dscfm} = \underline{2,176}$$

$$\text{Emission Rate lb/hr} = \frac{\text{lb of Antimony (Sb)}}{\text{Vm(std)}} \times \text{dscfm} \times 60 \text{ min/hr}$$

$$\text{Emission Rate lb/hr} = \underline{0.001}$$

MOSTARDI PLATT

Volumetric Flow Nomenclature

- A = Cross-sectional area of stack or duct, ft²
- Bws = Water vapor in gas stream, proportion by volume
- Cp = Pitot tube coefficient, dimensionless
- Md = Dry molecular weight of gas, lb/lb-mole
- Ms = Molecular weight of gas, wet basis, lb/lb-mole
- Mw = Molecular weight of water, 18.0 lb/lb-mole
- Pbar = Barometric pressure at testing site, in. Hg
- Pg = Static pressure of gas, in. Hg (in. H₂O/13.6)
- DH = Static pressure of gas, in. H₂O
- Ps = Absolute pressure of gas, in. Hg = Pbar + Pg
- Pstd = Standard absolute pressure, 29.92 in. Hg
- Acfm = Actual volumetric gas flow rate
- Scfm = Volumetric gas flow rate, corrected to standard conditions
- Dscfm = Standard volumetric flow rate, corrected to dry conditions
- R = Ideal gas constant, 21.85 in. Hg-ft³/°R-lb-mole
- Ts = Average stack gas temperature, °F
- Tm = Average dry gas meter temperature, °F
- Tstd = Standard absolute temperature, 528°R
- vs = Gas velocity, ft/sec
- Vm(std) = Volume of gas sampled, corrected to standard conditions, scf
- Vw(std) = Volume of water vapor in gas sample, corrected to standard conditions, scf
- Vlc = Volume of liquid collected
- Y = Dry gas meter calibration factor
- Δp = Velocity head of gas, in. H₂O
- K1 = 17.647 °R/in. Hg
- %EA = Percent excess air
- %CO₂ = Percent carbon dioxide by volume, dry basis
- %O₂ = Percent oxygen by volume, dry basis
- %N₂ = Percent nitrogen by volume, dry basis
- 0.264 = Ratio of O₂ to N₂ in air, v/v
- 0.28 = Molecular weight of N₂ or CO, divided by 100
- 0.32 = Molecular weight of O₂ divided by 100
- 0.44 = Molecular weight of CO₂ divided by 100
- 13.6 = Specific gravity of mercury (Hg)

MOSTARDI PLATT

Volumetric Air Flow Calculations

$$Vm (std) = 17.647 \times Vm \times \left[\frac{(P_{bar} + [\frac{DH}{13.6}])}{(460 + Tm)} \right] \times Y$$

$$Vw (std) = 0.0471 \times Vlc$$

$$Bws = \left[\frac{Vw (std)}{Vw (std) + Vm (std)} \right]$$

$$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + [0.28 \times (100 - \%CO_2 - \%O_2)]$$

$$Ms = Md \times (1 - Bws) + (18 \times Bws)$$

$$Vs = \sqrt{\frac{(Ts + 460)}{Ms \times Ps}} \times \sqrt{DP} \times Cp \times 85.49$$

$$Acfm = Vs \times Area (of stack or duct) \times 60$$

$$Scfm = Acfm \times 17.647 \times \left[\frac{Ps}{(460 + Ts)} \right]$$

$$Scfh = Scfm \times 60 \frac{min}{hr}$$

$$Dscfm = Scfm \times (1 - Bws)$$

MOSTARDI PLATT

Isokinetic Nomenclature

- A = Cross-sectional area of stack or duct, square feet
- A_n = Cross-sectional area of nozzle, square feet
- B_{ws} = Water vapor in gas stream, by volume
- C_a = Acetone blank residue concentration, g/g
- C_{acf} = Concentration of particulate matter in gas stream at actual conditions, gr/acf
- C_p = Pitot tube coefficient
- C_s = Concentration of particulate matter in gas stream, dry basis, corrected to standard conditions, gr/dscf
- IKV = Isokinetic sampling variance, must be $90.0\% \leq IKV \leq 110.0\%$
- M_d = Dry molecular weight of gas, lb/lb-mole
- M_s = Molecular weight of gas, wet basis, lb/lb-mole
- M_w = Molecular weight of water, 18.0 lb/lb-mole
- m_a = Mass of residue of acetone after evaporation, grams
- P_{bar} = Barometric pressure at testing site, inches mercury
- P_g = Static pressure of gas, inches mercury (inches water/13.6)
- P_s = Absolute pressure of gas, inches mercury = $P_{bar} + P_g$
- P_{std} = Standard absolute pressure, 29.92 inches mercury
- Q_{acfm} = Actual volumetric gas flow rate, acfm
- Q_{sd} = Dry volumetric gas flow rate corrected to standard conditions, dscfh
- R = Ideal gas constant, 21.85 inches mercury cubic foot/°R-lb-mole
- T_m = Dry gas meter temperature, °R
- T_s = Gas temperature, °R
- T_{std} = Absolute temperature, 528°R
- V_a = Volume of acetone blank, ml
- V_{aw} = Volume of acetone used in wash, ml
- W_a = Weight of residue in acetone wash, grams
- m_n = Total amount of particulate matter collected, grams
- V_{1c} = Total volume of liquid collected in impingers and silica gel, ml
- V_m = Volume of gas sample as measured by dry gas meter, dcf
- $V_{m(std)}$ = Volume of gas sample measured by dry gas meter, corrected to standard conditions, dscf
- v_s = Gas velocity, ft/sec
- $V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, scf
- Y = Dry gas meter calibration factor
- ΔH = Average pressure differential across the orifice meter, inches water
- Δp = Velocity head of gas, inches water
- ρ_a = Density of acetone, 0.7855 g/ml (average)
- ρ_w = Density of water, 0.002201 lb/ml
- θ = Total sampling time, minutes
- K_1 = 17.647 °R/in. Hg
- K_2 = 0.04707 ft³/ml
- K_4 = 0.09450/100 = 0.000945
- K_p = Pitot tube constant, $85.49 \frac{ft}{sec} \left[\frac{(lb/lb-mole)(in. Hg)}{(^{\circ}R)(in. H_2O)} \right]^{1/2}$
- %EA = Percent excess air
- %CO₂ = Percent carbon dioxide by volume, dry basis
- %O₂ = Percent oxygen by volume, dry basis
- %CO = Percent carbon monoxide by volume, dry basis
- %N₂ = Percent nitrogen by volume, dry basis
- 0.264 = Ratio of O₂ to N₂ in air, v/v
- 28 = Molecular weight of N₂ or CO
- 32 = Molecular weight of O₂
- 44 = Molecular weight of CO₂
- 13.6 = Specific gravity of mercury (Hg)

MOSTARDI PLATT

Isokinetic Calculation Formulas

$$1. V_{w(std)} = V_{lc} \left(\frac{\rho_w}{M_w} \right) \left(\frac{RT_{std}}{P_{std}} \right) = K_2 V_{lc}$$

$$2. V_{m(std)} = V_m Y \left(\frac{T_{std}}{T_m} \right) \left(\frac{(P_{bar} + (\frac{\Delta H}{13.6}))}{P_{std}} \right) = K_1 V_m Y \frac{(P_{bar} + (\frac{\Delta H}{13.6}))}{T_m}$$

$$3. B_{ws} = \frac{V_{w(std)}}{(V_{m(std)} + V_{w(std)})}$$

$$4. M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2)$$

$$5. M_s = M_d(1 - B_{ws}) + 18.0(B_{ws})$$

$$6. C_a = \frac{m_a}{V_a \rho_a}$$

$$7. W_a = C_a V_{aw} \rho_a$$

$$8. C_{acf} = 15.43 K_i \left(\frac{m_n P_s}{V_{w(std)} + V_{m(std)} T_s} \right)$$

$$9. C_s = (15.43 \text{ grains/gram}) (m_n / V_{m(std)})$$

$$10. v_s = K_p C_p \sqrt{\frac{\Delta P T_s}{P_s M_s}}$$

$$11. Q_{acfm} = v_s A (60 \text{ sec/min})$$

$$12. Q_{sd} = (3600 \text{ sec/hr}) (1 - B_{ws}) v_s \left(\frac{T_{std} P_s}{T_s P_{std}} \right) A$$

$$13. E (\text{emission rate, lbs/hr}) = Q_{std} (C_s / 7000 \text{ grains/lb})$$

$$14. IKV = \frac{T_s V_{m(std)} P_{std}}{T_{std} v_s \theta A_n P_s 60 (1 - B_{ws})} = K_4 \frac{T_s V_{m(std)}}{P_s v_s A_n \theta (1 - B_{ws})}$$

$$15. \%EA = \left(\frac{\%O_2 - (0.5 \%CO)}{0.264 \%N_2 - (\%O_2 - 0.5 \%CO)} \right) \times 100$$

MOSTARDI PLATT

Trace Metal (Including Mercury) Sample Calculations

Concentration

$$\frac{\mu g}{m^3} = \frac{\mu g \text{ of trace metal}}{dscf \text{ volume sampled} \times 0.02832 \frac{m^3}{ft^3}}$$

Emission Rate

$$\frac{\mu g \text{ of sample} \times \frac{1 \times 10^{-6} \text{ grams}}{\mu g}}{453.6 \text{ gr/lb}} = \text{lbs of trace metal}$$

$$\frac{\text{lbs of trace metal}}{V_m(\text{std})\text{sample}} \times dscfm \times 60 \frac{\text{min}}{\text{hr}} = \text{lbs of trace metal/hr}$$

Appendix D - Laboratory Sample Analysis

Your Project #: M154005
Site Location: ROCKFORD

Attention:Data Reporting

Mostardi Platt
888 Industrial Rd
Elmhurst, IL
USA 60126-1121

Report Date: 2015/10/29
Report #: R3738352
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5L0981

Received: 2015/10/16, 14:00

Sample Matrix: Stack Sampling Train
Samples Received: 27

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals B.H. in H2O2/HNO3 Imp.(6020A)	25	2015/10/27	2015/10/27	BRL SOP-00103 / BRL SOP- EPA M29/CARB 436 m 00102	
Metals F.H. in Filter + Rinses (6020A)	26	2015/10/28	2015/10/28	BRL SOP-00103/ BRL SOP- EPA M29/CARB 436 m 00102	
Metals in Liquid by ICP/MS (6020A)	1	2015/10/27	2015/10/27	BRL SOP-00103	EPA 3010A/6020A m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key



Clayton Johnson

29 Oct 2015 14:40:59 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: CJohnson@maxxam.ca

Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: BSL0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC523		BEC552	BEC552			
Sampling Date				2015/10/06	2015/10/06			
	UNITS	M5/29-BLANK	RDL	M5/29-NW BAGHOUSE-T1	M5/29-NW BAGHOUSE-T1 Lab-Dup	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	<0.40	0.40	37.6	38.1	0.80	4248555	0.080
Front Half Arsenic (As)	ug	<0.40	0.40	33.8	33.5	0.80	4248555	0.080
Front Half Barium (Ba)	ug	5.7	3.0	12.9	12.8	6.0	4248555	0.80
Front Half Beryllium (Be)	ug	<0.10	0.10	<0.20	<0.20	0.20	4248555	0.040
Front Half Cadmium (Cd)	ug	<0.10	0.10	0.91	0.86	0.20	4248555	0.040
Front Half Chromium (Cr)	ug	1.33	0.30	11.0	10.5	0.60	4248555	0.10
Front Half Cobalt (Co)	ug	<0.10	0.10	17.7	17.4	0.20	4248555	0.020
Front Half Copper (Cu)	ug	<2.0	2.0	346	339	4.0	4248555	0.20
Front Half Lead (Pb)	ug	0.94	0.20	795	781	0.40	4248555	0.040
Front Half Manganese (Mn)	ug	1.41	0.75	16.7	16.2	1.5	4248555	0.10
Front Half Nickel (Ni)	ug	<0.50	0.50	71.6	70.6	1.0	4248555	0.20
Front Half Selenium (Se)	ug	<1.0	1.0	<2.0	<2.0	2.0	4248555	0.50
Front Half Silver (Ag)	ug	<0.20	0.20	<0.40	<0.40	0.40	4248555	0.040
Front Half Zinc (Zn)	ug	<5.0	5.0	348	344	10	4248555	1.0
Back Half Antimony (Sb)	ug	<0.20	0.20	<0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	<0.20	0.20	0.57	0.57	0.20	4246778	0.040
Back Half Barium (Ba)	ug	<1.5	1.5	1.8	1.8	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	0.050	<0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	0.128	0.050	0.281	0.279	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	0.62	0.15	1.23	1.23	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	<0.050	0.050	0.272	0.273	0.050	4246778	0.010
Back Half Copper (Cu)	ug	<2.0	2.0	3.6	3.5	2.0	4246778	1.6
Back Half Lead (Pb)	ug	0.50	0.10	3.24	3.29	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	0.61	0.25	0.86	0.86	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	0.49	0.25	0.93	0.94	0.25	4246778	0.060
Back Half Selenium (Se)	ug	<0.50	0.50	<0.50	<0.50	0.50	4246778	0.20
Back Half Silver (Ag)	ug	<0.10	0.10	0.33	0.33	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	<2.5	2.5	9.7	9.8	2.5	4246778	0.60
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Lab-Dup = Laboratory Initiated Duplicate								

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC553	BEC555		BEC556			
Sampling Date		2015/10/06	2015/10/06		2015/10/06			
	UNITS	M5/29-NW BAGHOUSE-T2	M5/29-NW BAGHOUSE-T3	RDL	M5/29-BAGHOUSE SAND SEPARATOR-T1	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	14.4	13.8	0.80	241	2.0	4248555	0.080
Front Half Arsenic (As)	ug	13.0	11.0	0.80	12.0	2.0	4248555	0.080
Front Half Barium (Ba)	ug	9.6	8.8	6.0	113	15	4248555	0.80
Front Half Beryllium (Be)	ug	<0.20	<0.20	0.20	<0.50	0.50	4248555	0.040
Front Half Cadmium (Cd)	ug	0.47	0.56	0.20	10.7	0.50	4248555	0.040
Front Half Chromium (Cr)	ug	5.98	5.58	0.60	73.9	1.5	4248555	0.10
Front Half Cobalt (Co)	ug	6.74	6.25	0.20	57.7	0.50	4248555	0.020
Front Half Copper (Cu)	ug	183	278	4.0	30600	40	4248555	0.20
Front Half Lead (Pb)	ug	408	469	0.40	20900	4.0	4248555	0.040
Front Half Manganese (Mn)	ug	8.7	10.6	1.5	826	3.8	4248555	0.10
Front Half Nickel (Ni)	ug	29.3	28.7	1.0	332	2.5	4248555	0.20
Front Half Selenium (Se)	ug	<2.0	<2.0	2.0	<5.0	5.0	4248555	0.50
Front Half Silver (Ag)	ug	<0.40	<0.40	0.40	11.8	1.0	4248555	0.040
Front Half Zinc (Zn)	ug	169	171	10	8980	25	4248555	1.0
Back Half Antimony (Sb)	ug	<0.20	<0.20	0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	0.47	0.35	0.20	<0.20	0.20	4246778	0.040
Back Half Barium (Ba)	ug	1.8	<1.5	1.5	2.6	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	1.28	2.36	0.050	0.275	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	1.05	0.91	0.15	1.80	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	0.185	0.363	0.050	0.264	0.050	4246778	0.010
Back Half Copper (Cu)	ug	3.0	6.3	2.0	2.2	2.0	4246778	1.6
Back Half Lead (Pb)	ug	2.97	2.61	0.10	2.66	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	1.06	1.01	0.25	1.61	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	1.17	1.00	0.25	1.29	0.25	4246778	0.060
Back Half Selenium (Se)	ug	<0.50	<0.50	0.50	0.65	0.50	4246778	0.20
Back Half Silver (Ag)	ug	0.13	<0.10	0.10	0.16	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	4.2	3.8	2.5	11.9	2.5	4246778	0.60
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC557	BEC558		BEC559	BEC560			
Sampling Date		2015/10/06	2015/10/06		2015/10/06	2015/10/06			
	UNITS	M5/29-BAGHOUSE SAND SEPARATOR-T2	M5/29-BAGHOUSE SAND SEPARATOR-T3	RDL	M5/29-BAGHOUSE GAS COOLER-T1	M5/29-BAGHOUSE GAS COOLER-T2	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	219	137	2.0	150	49.2	2.0	4248555	0.080
Front Half Arsenic (As)	ug	11.8	7.3	2.0	18.1	53.4	2.0	4248555	0.080
Front Half Barium (Ba)	ug	109	73	15	57	<15	15	4248555	0.80
Front Half Beryllium (Be)	ug	<0.50	<0.50	0.50	<0.50	<0.50	0.50	4248555	0.040
Front Half Cadmium (Cd)	ug	9.03	7.59	0.50	1.17	1.32	0.50	4248555	0.040
Front Half Chromium (Cr)	ug	53.0	43.4	1.5	47.3	33.7	1.5	4248555	0.10
Front Half Cobalt (Co)	ug	39.8	24.2	0.50	44.6	20.7	0.50	4248555	0.020
Front Half Copper (Cu)	ug	17000	10100	40	1040	225	10	4248555	0.20
Front Half Lead (Pb)	ug	16300	10500	4.0	4270	807	1.0	4248555	0.040
Front Half Manganese (Mn)	ug	582	361	3.8	66.5	18.6	3.8	4248555	0.10
Front Half Nickel (Ni)	ug	229	176	2.5	466	468	2.5	4248555	0.20
Front Half Selenium (Se)	ug	<5.0	<5.0	5.0	<5.0	<5.0	5.0	4248555	0.50
Front Half Silver (Ag)	ug	8.0	9.6	1.0	<1.0	<1.0	1.0	4248555	0.040
Front Half Zinc (Zn)	ug	7740	4910	25	541	137	25	4248555	1.0
Back Half Antimony (Sb)	ug	0.35	<0.20	0.20	<0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	<0.20	<0.20	0.20	1.02	34.0	0.20	4246778	0.040
Back Half Barium (Ba)	ug	2.2	<1.5	1.5	3.1	1.7	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	0.050	<0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	0.539	2.49	0.050	0.471	3.02	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	1.00	0.94	0.15	0.87	1.60	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	0.231	0.179	0.050	0.263	0.351	0.050	4246778	0.010
Back Half Copper (Cu)	ug	2.8	5.3	2.0	4.1	6.9	2.0	4246778	1.6
Back Half Lead (Pb)	ug	4.19	2.28	0.10	3.18	5.11	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	1.21	1.01	0.25	1.13	1.29	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	1.33	0.95	0.25	0.95	2.07	0.25	4246778	0.060
Back Half Selenium (Se)	ug	12.7	<0.50	0.50	0.72	<0.50	0.50	4246778	0.20
Back Half Silver (Ag)	ug	0.12	<0.10	0.10	0.10	<0.10	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	22.4	3.1	2.5	6.9	21.3	2.5	4246778	0.60
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC561	BEC562	BEC565	BEC566	BEC567			
Sampling Date		2015/10/06	2015/10/07	2015/10/07	2015/10/07	2015/10/07			
	UNITS	M5/29-BAGHOUSE GAS COOLER-T3	M5/29-BLUE BAGHOUSE-T1	M5/29-BLUE BAGHOUSE-T2	M5/29-BLUE BAGHOUSE-T3	M5/29-BLUE BAGHOUSE-T4	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	33.0	5.95	1.67	1.46	0.98	0.80	4248555	0.080
Front Half Arsenic (As)	ug	20.5	4.09	1.00	<0.80	<0.80	0.80	4248555	0.080
Front Half Barium (Ba)	ug	17.9	10.5	10.4	10.4	8.0	6.0	4248555	0.80
Front Half Beryllium (Be)	ug	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4248555	0.040
Front Half Cadmium (Cd)	ug	0.48	0.31	1.69	0.91	<0.20	0.20	4248555	0.040
Front Half Chromium (Cr)	ug	20.5	8.30	7.65	6.69	3.85	0.60	4248555	0.10
Front Half Cobalt (Co)	ug	10.9	4.28	2.17	2.12	1.33	0.20	4248555	0.020
Front Half Copper (Cu)	ug	150	263	158	155	81.9	4.0	4248555	0.20
Front Half Lead (Pb)	ug	531	234	55.8	41.2	33.9	0.40	4248555	0.040
Front Half Manganese (Mn)	ug	12.9	22.8	10.6	10.8	6.8	1.5	4248555	0.10
Front Half Nickel (Ni)	ug	202	56.7	60.9	49.4	23.8	1.0	4248555	0.20
Front Half Selenium (Se)	ug	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	4248555	0.50
Front Half Silver (Ag)	ug	<0.40	<0.40	0.42	0.83	1.24	0.40	4248555	0.040
Front Half Zinc (Zn)	ug	107	234	99	91	58	10	4248555	1.0
Back Half Antimony (Sb)	ug	<0.20	0.31	<0.20	<0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	1.37	<0.20	<0.20	<0.20	<0.20	0.20	4246778	0.040
Back Half Barium (Ba)	ug	3.0	1.7	1.6	<1.5	1.8	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	2.81	0.344	0.123	0.315	0.057	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	1.16	1.23	1.43	1.02	2.31	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	0.884	0.593	0.696	0.668	0.522	0.050	4246778	0.010
Back Half Copper (Cu)	ug	7.8	4.6	11.3	3.8	3.4	2.0	4246778	1.6
Back Half Lead (Pb)	ug	7.15	5.31	4.99	4.20	5.55	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	1.13	1.59	1.36	1.09	1.44	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	1.44	1.88	1.52	1.76	3.07	0.25	4246778	0.060
Back Half Selenium (Se)	ug	1.05	2.54	<0.50	0.91	<0.50	0.50	4246778	0.20
Back Half Silver (Ag)	ug	<0.10	0.49	<0.10	<0.10	<0.10	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	3.6	8.8	4.0	4.6	<2.5	2.5	4246778	0.60
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC572	BEC573	BEC574		BEC575			
Sampling Date		2015/10/07	2015/10/07	2015/10/07		2015/10/07			
	UNITS	M5/29-BAGHO USE SWEECO-T1	M5/29-BAGHO USE SWEECO-T2	M5/29-BAGHO USE SWEECO-T3	RDL	M5/29-BAGHO USE SWEECO-T4	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	6.8	8.1	6.5	2.0	8.0	4.0	4248555	0.080
Front Half Arsenic (As)	ug	<2.0	<2.0	<2.0	2.0	<4.0	4.0	4248555	0.080
Front Half Barium (Ba)	ug	63	33	41	15	36	30	4248555	0.80
Front Half Beryllium (Be)	ug	<0.50	<0.50	<0.50	0.50	<1.0	1.0	4248555	0.040
Front Half Cadmium (Cd)	ug	2.96	0.54	0.78	0.50	<1.0	1.0	4248555	0.040
Front Half Chromium (Cr)	ug	10.0	8.4	10.1	1.5	10.4	3.0	4248555	0.10
Front Half Cobalt (Co)	ug	4.28	6.86	6.57	0.50	5.6	1.0	4248555	0.020
Front Half Copper (Cu)	ug	604	2510	2340	10	2180	20	4248555	0.20
Front Half Lead (Pb)	ug	333	607	540	1.0	620	2.0	4248555	0.040
Front Half Manganese (Mn)	ug	29.5	51.1	81.7	3.8	69.1	7.5	4248555	0.10
Front Half Nickel (Ni)	ug	48.8	38.6	59.7	2.5	48.7	5.0	4248555	0.20
Front Half Selenium (Se)	ug	<5.0	<5.0	<5.0	5.0	<10	10	4248555	0.50
Front Half Silver (Ag)	ug	<1.0	1.9	4.1	1.0	7.2	2.0	4248555	0.040
Front Half Zinc (Zn)	ug	530	912	797	25	890	50	4248555	1.0
Back Half Antimony (Sb)	ug	0.31	<0.20	<0.20	0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	<0.20	<0.20	<0.20	0.20	<0.20	0.20	4246778	0.040
Back Half Barium (Ba)	ug	2.0	2.1	<1.5	1.5	<1.5	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	<0.050	0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	0.444	0.255	0.120	0.050	0.332	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	9.43	6.54	7.91	0.15	8.30	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	0.878	0.660	0.339	0.050	1.11	0.050	4246778	0.010
Back Half Copper (Cu)	ug	10.0	19.7	6.0	2.0	18.1	2.0	4246778	1.6
Back Half Lead (Pb)	ug	7.35	7.12	3.90	0.10	8.41	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	3.05	2.42	1.49	0.25	1.80	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	16.5	8.34	5.51	0.25	5.12	0.25	4246778	0.060
Back Half Selenium (Se)	ug	<0.50	<0.50	<0.50	0.50	<0.50	0.50	4246778	0.20
Back Half Silver (Ag)	ug	0.24	0.11	0.16	0.10	<0.10	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	11.9	12.4	3.4	2.5	6.6	2.5	4246778	0.60
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC576	BEC577		BEC578	BEC578			
Sampling Date		2015/10/07	2015/10/07		2015/10/07	2015/10/07			
	UNITS	M5/29-BAGHO USE INLET-T1	M5/29-BAGHO USE INLET-T2	QC Batch	M5/29-BAGHO USE INLET-T3	M5/29- BAGHOUSE INLET-T3 Lab-Dup	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	72.3	9.9	4248555	107	107	2.0	4248561	0.080
Front Half Arsenic (As)	ug	17.6	7.5	4248555	8.1	8.0	2.0	4248561	0.080
Front Half Barium (Ba)	ug	<15	<15	4248555	17	17	15	4248561	0.80
Front Half Beryllium (Be)	ug	<0.50	<0.50	4248555	<0.50	<0.50	0.50	4248561	0.040
Front Half Cadmium (Cd)	ug	1.61	1.17	4248555	2.91	3.05	0.50	4248561	0.040
Front Half Chromium (Cr)	ug	9.2	4.5	4248555	4.7	4.9	1.5	4248561	0.10
Front Half Cobalt (Co)	ug	3.30	1.08	4248555	2.25	2.19	0.50	4248561	0.020
Front Half Copper (Cu)	ug	215	77	4248555	173	174	10	4248561	0.20
Front Half Lead (Pb)	ug	1780	769	4248555	1480	1480	1.0	4248561	0.040
Front Half Manganese (Mn)	ug	12.3	5.2	4248555	7.2	7.2	3.8	4248561	0.10
Front Half Nickel (Ni)	ug	31.7	11.8	4248555	17.7	18.1	2.5	4248561	0.20
Front Half Selenium (Se)	ug	<5.0	<5.0	4248555	<5.0	<5.0	5.0	4248561	0.50
Front Half Silver (Ag)	ug	<1.0	<1.0	4248555	<1.0	<1.0	1.0	4248561	0.040
Front Half Zinc (Zn)	ug	174	58	4248555	99	98	25	4248561	1.0
Back Half Antimony (Sb)	ug	<0.20	0.21	4246778	3.35	3.30	0.20	4246784	0.040
Back Half Arsenic (As)	ug	1.69	0.29	4246778	1.08	1.08	0.20	4246784	0.040
Back Half Barium (Ba)	ug	1.7	3.3	4246778	1.9	1.8	1.5	4246784	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	4246778	<0.050	<0.050	0.050	4246784	0.050
Back Half Cadmium (Cd)	ug	0.264	0.260	4246778	0.135	0.123	0.050	4246784	0.030
Back Half Chromium (Cr)	ug	20.9	62.3	4246778	16.1	16.0	0.15	4246784	0.070
Back Half Cobalt (Co)	ug	0.642	1.34	4246778	0.585	0.581	0.050	4246784	0.010
Back Half Copper (Cu)	ug	17.6	18.2	4246778	6.9	6.7	2.0	4246784	1.6
Back Half Lead (Pb)	ug	10.9	13.8	4246778	6.21	6.21	0.10	4246784	0.040
Back Half Manganese (Mn)	ug	1.99	2.10	4246778	2.10	2.06	0.25	4246784	0.060
Back Half Nickel (Ni)	ug	12.9	16.4	4246778	6.66	6.51	0.25	4246784	0.060
Back Half Selenium (Se)	ug	0.55	0.71	4246778	0.53	0.53	0.50	4246784	0.20
Back Half Silver (Ag)	ug	0.11	1.15	4246778	0.24	0.24	0.10	4246784	0.020
Back Half Zinc (Zn)	ug	17.2	10.9	4246778	6.2	5.6	2.5	4246784	0.60
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC579		BEC580	BEC581		BEC582			
Sampling Date		2015/10/07		2015/10/07	2015/10/07		2015/10/07			
	UNITS	M5/29-BAGHO USE INLET-T4	RDL	M5/29-TPU BAGHOUSE INLET-T1	M5/29-TPU BAGHOUSE INLET-T2	RDL	M5/29-TPU BAGHOUSE INLET-T3	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	8.4	2.0	30	39	20	<20	20	4248561	0.080
Front Half Arsenic (As)	ug	4.3	2.0	<20	<20	20	<20	20	4248561	0.080
Front Half Barium (Ba)	ug	<15	15	<150	<150	150	<150	150	4248561	0.80
Front Half Beryllium (Be)	ug	<0.50	0.50	<5.0	<5.0	5.0	<5.0	5.0	4248561	0.040
Front Half Cadmium (Cd)	ug	<0.50	0.50	6.5	<5.0	5.0	<5.0	5.0	4248561	0.040
Front Half Chromium (Cr)	ug	3.2	1.5	4370	2840	15	1710	15	4248561	0.10
Front Half Cobalt (Co)	ug	0.66	0.50	737	1450	5.0	897	5.0	4248561	0.020
Front Half Copper (Cu)	ug	77	10	66300	149000	100	481000 (1)	500	4248561	0.20
Front Half Lead (Pb)	ug	1660	1.0	2930	1850	10	1860	10	4248561	0.040
Front Half Manganese (Mn)	ug	<3.8	3.8	8860	3590	38	635	38	4248561	0.10
Front Half Nickel (Ni)	ug	10.1	2.5	46600	29900	25	21300	25	4248561	0.20
Front Half Selenium (Se)	ug	<5.0	5.0	<50	<50	50	<50	50	4248561	0.50
Front Half Silver (Ag)	ug	<1.0	1.0	<10	<10	10	18	10	4248561	0.040
Front Half Zinc (Zn)	ug	51	25	103000	29200	250	4380	250	4248561	1.0
Back Half Antimony (Sb)	ug	0.37	0.20	5.38	1.75	0.20	7.16	0.20	4246784	0.040
Back Half Arsenic (As)	ug	0.26	0.20	0.26	<0.20	0.20	0.36	0.20	4246784	0.040
Back Half Barium (Ba)	ug	3.3	1.5	<1.5	<1.5	1.5	3.8	1.5	4246784	0.040
Back Half Beryllium (Be)	ug	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4246784	0.050
Back Half Cadmium (Cd)	ug	0.236	0.050	0.173	0.080	0.050	0.105	0.050	4246784	0.030
Back Half Chromium (Cr)	ug	7.76	0.15	1.68	1.35	0.15	2.23	0.15	4246784	0.070
Back Half Cobalt (Co)	ug	0.683	0.050	3.23	1.58	0.050	9.46	0.050	4246784	0.010
Back Half Copper (Cu)	ug	7.2	2.0	16.3	8.1	2.0	28.1	2.0	4246784	1.6
Back Half Lead (Pb)	ug	7.71	0.10	293	82.4	0.10	537	0.10	4246784	0.040
Back Half Manganese (Mn)	ug	2.03	0.25	1.22	1.25	0.25	3.46	0.25	4246784	0.060
Back Half Nickel (Ni)	ug	4.28	0.25	4.93	8.61	0.25	7.98	0.25	4246784	0.060
Back Half Selenium (Se)	ug	<0.50	0.50	8.92	52.5	0.50	1.20	0.50	4246784	0.20
Back Half Silver (Ag)	ug	0.16	0.10	<0.10	<0.10	0.10	<0.10	0.10	4246784	0.020
Back Half Zinc (Zn)	ug	4.2	2.5	17.7	19.5	2.5	11.8	2.5	4246784	0.60
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
(1) Extra 250x dilution reported										

Maxxam Job #: BSL0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

ELEMENTS BY ICP/MS (STACK SAMPLING TRAIN)

Maxxam ID		BEC632	BEC640			
Sampling Date						
	UNITS	AUDIT-0929150-1425	AUDIT-0929150-1426	RDL	QC Batch	MDL
Total Antimony (Sb)	ug/mL	N/A	1.78	0.010	4247327	N/A
Total Arsenic (As)	ug/mL	N/A	0.902	0.010	4247327	N/A
Total Barium (Ba)	ug/mL	N/A	1.10	0.060	4247327	N/A
Total Beryllium (Be)	ug/mL	N/A	1.45	0.0020	4247327	N/A
Total Cadmium (Cd)	ug/mL	N/A	1.17	0.0020	4247327	N/A
Total Chromium (Cr)	ug/mL	N/A	2.51	0.0050	4247327	N/A
Total Cobalt (Co)	ug/mL	N/A	1.96	0.0020	4247327	N/A
Total Copper (Cu)	ug/mL	N/A	1.29	0.010	4247327	N/A
Total Lead (Pb)	ug/mL	N/A	0.719	0.0050	4247327	N/A
Total Manganese (Mn)	ug/mL	N/A	0.343	0.010	4247327	N/A
Total Nickel (Ni)	ug/mL	N/A	0.372	0.010	4247327	N/A
Total Selenium (Se)	ug/mL	N/A	1.81	0.020	4247327	N/A
Total Silver (Ag)	ug/mL	N/A	0.878	0.0050	4247327	N/A
Total Zinc (Zn)	ug/mL	N/A	1.74	0.050	4247327	N/A
Front Half Antimony (Sb)	ug	32.2	N/A	0.40	4248561	0.080
Front Half Arsenic (As)	ug	26.4	N/A	0.40	4248561	0.080
Front Half Barium (Ba)	ug	31.4	N/A	3.0	4248561	0.80
Front Half Beryllium (Be)	ug	12.5	N/A	0.10	4248561	0.040
Front Half Cadmium (Cd)	ug	13.2	N/A	0.10	4248561	0.040
Front Half Chromium (Cr)	ug	21.0	N/A	0.30	4248561	0.10
Front Half Cobalt (Co)	ug	14.6	N/A	0.10	4248561	0.020
Front Half Copper (Cu)	ug	14.2	N/A	2.0	4248561	0.20
Front Half Lead (Pb)	ug	27.4	N/A	0.20	4248561	0.040
Front Half Manganese (Mn)	ug	14.5	N/A	0.75	4248561	0.10
Front Half Nickel (Ni)	ug	27.1	N/A	0.50	4248561	0.20
Front Half Selenium (Se)	ug	26.9	N/A	1.0	4248561	0.50
Front Half Silver (Ag)	ug	40.8	N/A	0.20	4248561	0.040
Front Half Zinc (Zn)	ug	29.0	N/A	5.0	4248561	1.0
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
N/A = Not Applicable						

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC523
Sample ID: M5/29-BLANK
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC552
Sample ID: M5/29-NW BAGHOUSE-T1
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC552 Dup
Sample ID: M5/29-NW BAGHOUSE-T1
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/29	2015/10/28	Nan Raykha

Maxxam ID: BEC553
Sample ID: M5/29-NW BAGHOUSE-T2
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC555
Sample ID: M5/29-NW BAGHOUSE-T3
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC556
Sample ID: M5/29-BAGHOUSE SAND SEPARATOR-T1
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC557
Sample ID: M5/29-BAGHOUSE SAND SEPARATOR-T2
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC558
Sample ID: M5/29-BAGHOUSE SAND SEPARATOR-T3
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC559
Sample ID: M5/29-BAGHOUSE GAS COOLER-T1
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC560
Sample ID: M5/29-BAGHOUSE GAS COOLER-T2
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC561
Sample ID: M5/29-BAGHOUSE GAS COOLER-T3
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC562
Sample ID: M5/29-BLUE BAGHOUSE-T1
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam Job #: B5L0981
 Report Date: 2015/10/29

Mostardi Platt
 Client Project #: M154005
 Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC565
Sample ID: M5/29-BLUE BAGHOUSE-T2
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC566
Sample ID: M5/29-BLUE BAGHOUSE-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC567
Sample ID: M5/29-BLUE BAGHOUSE-T4
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC572
Sample ID: M5/29-BAGHOUSE SWEECO-T1
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC573
Sample ID: M5/29-BAGHOUSE SWEECO-T2
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC574
Sample ID: M5/29-BAGHOUSE SWEECO-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC575
Sample ID: M5/29-BAGHOUSE SWEECO-T4
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC576
Sample ID: M5/29-BAGHOUSE INLET-T1
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC577
Sample ID: M5/29-BAGHOUSE INLET-T2
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC578
Sample ID: M5/29-BAGHOUSE INLET-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC578 Dup
Sample ID: M5/29-BAGHOUSE INLET-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC579
Sample ID: M5/29-BAGHOUSE INLET-T4
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC580
Sample ID: M5/29-TPU BAGHOUSE INLET-T1
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC581
Sample ID: M5/29-TPU BAGHOUSE INLET-T2
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC582
Sample ID: M5/29-TPU BAGHOUSE INLET-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC632
Sample ID: AUDIT-092915O-1425
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC640
Sample ID: AUDIT-092915O-1426
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Liquid by ICP/MS (6020A)	ICP1/MS	4247327	2015/10/27	2015/10/27	Nan Raykha

GENERAL COMMENTS

Sample BEC556-01 : Extra 20x dilution was reported for Cu and Pb for this sample.

Sample BEC557-01 : Extra 20x dilution was reported for Cu and Pb for this sample.

Sample BEC558-01 : Extra 20x dilution was reported for Cu and Pb for this sample.

EPA M29 METALS (FRONT & BACK SEPARATE)

Metals F.H. in Filter + Rinses (6020A): Extra 2x, 5x or 10x dilution was required for all samples except BEC523, due to the matrix and high levels.

Post digestion duplicate and spike were done on sample BEC552.

Trace level Ba was observed in the Processed Blank.

Metals B.H. in H2O2/HNO3 Imp.(6020A): Post digestion duplicate and spike were done on sample BEC552.

Sample digests for BEC560, BEC575 and BEC577 were reanalyzed on 2015-10-28 to confirm data.

Metals F.H. in Filter + Rinses (6020A): Extra 5x or 50x dilution was required for all samples due to the matrix and high levels.

Post digestion duplicate and spike were done on sample BEC578.

Trace level Zn and Ba were observed in the Processed Blank.

Metals B.H. in H2O2/HNO3 Imp.(6020A): Post digestion duplicate and spike were done on sample BEC578.

Sample digests for BEC580 and BEC581 were reanalyzed on 2015-10-28 to confirm data.

ELEMENTS BY ICP/MS (STACK SAMPLING TRAIN)

Metals F.H. in Filter + Rinses (6020A): Extra 5x or 50x dilution was required for all samples due to the matrix and high levels.

Post digestion duplicate and spike were done on sample BEC578.

Trace level Zn and Ba were observed in the Processed Blank.

Results relate only to the items tested.

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4246778	N_R	Matrix Spike(BEC552)		Back Half Antimony (Sb)	2015/10/27		96	%	70 - 130
				Back Half Arsenic (As)	2015/10/27		95	%	70 - 130
				Back Half Barium (Ba)	2015/10/27		99	%	70 - 130
				Back Half Beryllium (Be)	2015/10/27		97	%	70 - 130
				Back Half Cadmium (Cd)	2015/10/27		94	%	70 - 130
				Back Half Chromium (Cr)	2015/10/27		98	%	70 - 130
				Back Half Cobalt (Co)	2015/10/27		98	%	70 - 130
				Back Half Copper (Cu)	2015/10/27		97	%	70 - 130
				Back Half Lead (Pb)	2015/10/27		98	%	70 - 130
				Back Half Manganese (Mn)	2015/10/27		97	%	70 - 130
				Back Half Nickel (Ni)	2015/10/27		98	%	70 - 130
				Back Half Selenium (Se)	2015/10/27		90	%	70 - 130
				Back Half Silver (Ag)	2015/10/27		99	%	70 - 130
				Back Half Zinc (Zn)	2015/10/27		93	%	70 - 130
4246778	N_R	Matrix Spike DUP(BEC552)		Back Half Antimony (Sb)	2015/10/27		96	%	70 - 130
				Back Half Arsenic (As)	2015/10/27		94	%	70 - 130
				Back Half Barium (Ba)	2015/10/27		99	%	70 - 130
				Back Half Beryllium (Be)	2015/10/27		96	%	70 - 130
				Back Half Cadmium (Cd)	2015/10/27		95	%	70 - 130
				Back Half Chromium (Cr)	2015/10/27		99	%	70 - 130
				Back Half Cobalt (Co)	2015/10/27		100	%	70 - 130
				Back Half Copper (Cu)	2015/10/27		98	%	70 - 130
				Back Half Lead (Pb)	2015/10/27		97	%	70 - 130
				Back Half Manganese (Mn)	2015/10/27		98	%	70 - 130
				Back Half Nickel (Ni)	2015/10/27		99	%	70 - 130
				Back Half Selenium (Se)	2015/10/27		91	%	70 - 130
				Back Half Silver (Ag)	2015/10/27		100	%	70 - 130
				Back Half Zinc (Zn)	2015/10/27		92	%	70 - 130
4246778	N_R	MS/MSD RPD		Back Half Antimony (Sb)	2015/10/27	0		%	20
				Back Half Arsenic (As)	2015/10/27	1.1		%	20
				Back Half Barium (Ba)	2015/10/27	0		%	20
				Back Half Beryllium (Be)	2015/10/27	1.0		%	20
				Back Half Cadmium (Cd)	2015/10/27	1.1		%	20
				Back Half Chromium (Cr)	2015/10/27	1.0		%	20
				Back Half Cobalt (Co)	2015/10/27	2.0		%	20
				Back Half Copper (Cu)	2015/10/27	1.0		%	20
				Back Half Lead (Pb)	2015/10/27	1.0		%	20
				Back Half Manganese (Mn)	2015/10/27	1.0		%	20
				Back Half Nickel (Ni)	2015/10/27	1.0		%	20
				Back Half Selenium (Se)	2015/10/27	1.1		%	20
				Back Half Silver (Ag)	2015/10/27	1.0		%	20
				Back Half Zinc (Zn)	2015/10/27	1.1		%	20
4246778	N_R	Spiked Blank		Back Half Antimony (Sb)	2015/10/27		100	%	85 - 115
				Back Half Arsenic (As)	2015/10/27		98	%	85 - 115
				Back Half Barium (Ba)	2015/10/27		100	%	85 - 115
				Back Half Beryllium (Be)	2015/10/27		98	%	85 - 115
				Back Half Cadmium (Cd)	2015/10/27		97	%	85 - 115
				Back Half Chromium (Cr)	2015/10/27		101	%	85 - 115
				Back Half Cobalt (Co)	2015/10/27		102	%	85 - 115
				Back Half Copper (Cu)	2015/10/27		100	%	85 - 115
				Back Half Lead (Pb)	2015/10/27		100	%	85 - 115
				Back Half Manganese (Mn)	2015/10/27		100	%	85 - 115
				Back Half Nickel (Ni)	2015/10/27		101	%	85 - 115

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4246778	N_R	Spiked Blank DUP	Back Half Selenium (Se)	2015/10/27		94	%	85 - 115
			Back Half Silver (Ag)	2015/10/27		104	%	85 - 115
			Back Half Zinc (Zn)	2015/10/27		96	%	85 - 115
			Back Half Antimony (Sb)	2015/10/27		101	%	85 - 115
			Back Half Arsenic (As)	2015/10/27		99	%	85 - 115
			Back Half Barium (Ba)	2015/10/27		102	%	85 - 115
			Back Half Beryllium (Be)	2015/10/27		98	%	85 - 115
			Back Half Cadmium (Cd)	2015/10/27		99	%	85 - 115
			Back Half Chromium (Cr)	2015/10/27		102	%	85 - 115
			Back Half Cobalt (Co)	2015/10/27		103	%	85 - 115
			Back Half Copper (Cu)	2015/10/27		101	%	85 - 115
			Back Half Lead (Pb)	2015/10/27		103	%	85 - 115
			Back Half Manganese (Mn)	2015/10/27		101	%	85 - 115
			Back Half Nickel (Ni)	2015/10/27		102	%	85 - 115
			Back Half Selenium (Se)	2015/10/27		93	%	85 - 115
			Back Half Silver (Ag)	2015/10/27		104	%	85 - 115
			Back Half Zinc (Zn)	2015/10/27		96	%	85 - 115
4246778	N_R	RPD	Back Half Antimony (Sb)	2015/10/27	1.3		%	20
			Back Half Arsenic (As)	2015/10/27	0.91		%	20
			Back Half Barium (Ba)	2015/10/27	2.1		%	20
			Back Half Beryllium (Be)	2015/10/27	0.50		%	20
			Back Half Cadmium (Cd)	2015/10/27	1.6		%	20
			Back Half Chromium (Cr)	2015/10/27	1.0		%	20
			Back Half Cobalt (Co)	2015/10/27	0.97		%	20
			Back Half Copper (Cu)	2015/10/27	1.2		%	20
			Back Half Lead (Pb)	2015/10/27	2.6		%	20
			Back Half Manganese (Mn)	2015/10/27	1.2		%	20
			Back Half Nickel (Ni)	2015/10/27	1.4		%	20
			Back Half Selenium (Se)	2015/10/27	0.23		%	20
			Back Half Silver (Ag)	2015/10/27	0.21		%	20
			Back Half Zinc (Zn)	2015/10/27	0.42		%	20
4246778	N_R	Method Blank	Back Half Antimony (Sb)	2015/10/27	<0.20		ug	
			Back Half Arsenic (As)	2015/10/27	<0.20		ug	
			Back Half Barium (Ba)	2015/10/27	<1.5		ug	
			Back Half Beryllium (Be)	2015/10/27	<0.050		ug	
			Back Half Cadmium (Cd)	2015/10/27	<0.050		ug	
			Back Half Chromium (Cr)	2015/10/27	<0.15		ug	
			Back Half Cobalt (Co)	2015/10/27	<0.050		ug	
			Back Half Copper (Cu)	2015/10/27	<2.0		ug	
			Back Half Lead (Pb)	2015/10/27	<0.10		ug	
			Back Half Manganese (Mn)	2015/10/27	<0.25		ug	
			Back Half Nickel (Ni)	2015/10/27	<0.25		ug	
			Back Half Selenium (Se)	2015/10/27	<0.50		ug	
			Back Half Silver (Ag)	2015/10/27	<0.10		ug	
			Back Half Zinc (Zn)	2015/10/27	<2.5		ug	
4246778	N_R	RPD - Sample/Sample Dup	Back Half Antimony (Sb)	2015/10/27	NC		%	20
			Back Half Arsenic (As)	2015/10/27	NC		%	20
			Back Half Barium (Ba)	2015/10/27	NC		%	20
			Back Half Beryllium (Be)	2015/10/27	NC		%	20
			Back Half Cadmium (Cd)	2015/10/27	0.54		%	20
			Back Half Chromium (Cr)	2015/10/27	0		%	20
			Back Half Cobalt (Co)	2015/10/27	0.55		%	20
			Back Half Copper (Cu)	2015/10/27	NC		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4246784	N_R	Matrix Spike(BEC578)		Back Half Lead (Pb)	2015/10/27	1.5		%	20
				Back Half Manganese (Mn)	2015/10/27	NC		%	20
				Back Half Nickel (Ni)	2015/10/27	NC		%	20
				Back Half Selenium (Se)	2015/10/27	NC		%	20
				Back Half Silver (Ag)	2015/10/27	NC		%	20
				Back Half Zinc (Zn)	2015/10/27	NC		%	20
				Back Half Antimony (Sb)	2015/10/27		94	%	70 - 130
				Back Half Arsenic (As)	2015/10/27		90	%	70 - 130
				Back Half Barium (Ba)	2015/10/27		98	%	70 - 130
				Back Half Beryllium (Be)	2015/10/27		90	%	70 - 130
				Back Half Cadmium (Cd)	2015/10/27		91	%	70 - 130
				Back Half Chromium (Cr)	2015/10/27		97	%	70 - 130
				Back Half Cobalt (Co)	2015/10/27		98	%	70 - 130
				Back Half Copper (Cu)	2015/10/27		96	%	70 - 130
				Back Half Lead (Pb)	2015/10/27		96	%	70 - 130
				Back Half Manganese (Mn)	2015/10/27		95	%	70 - 130
				Back Half Nickel (Ni)	2015/10/27		97	%	70 - 130
				Back Half Selenium (Se)	2015/10/27		84	%	70 - 130
				Back Half Silver (Ag)	2015/10/27		97	%	70 - 130
				Back Half Zinc (Zn)	2015/10/27		86	%	70 - 130
4246784	N_R	Matrix Spike DUP(BEC578)		Back Half Antimony (Sb)	2015/10/27		94	%	70 - 130
				Back Half Arsenic (As)	2015/10/27		92	%	70 - 130
				Back Half Barium (Ba)	2015/10/27		99	%	70 - 130
				Back Half Beryllium (Be)	2015/10/27		90	%	70 - 130
				Back Half Cadmium (Cd)	2015/10/27		92	%	70 - 130
				Back Half Chromium (Cr)	2015/10/27		99	%	70 - 130
				Back Half Cobalt (Co)	2015/10/27		100	%	70 - 130
				Back Half Copper (Cu)	2015/10/27		98	%	70 - 130
				Back Half Lead (Pb)	2015/10/27		96	%	70 - 130
				Back Half Manganese (Mn)	2015/10/27		97	%	70 - 130
				Back Half Nickel (Ni)	2015/10/27		99	%	70 - 130
				Back Half Selenium (Se)	2015/10/27		86	%	70 - 130
				Back Half Silver (Ag)	2015/10/27		97	%	70 - 130
				Back Half Zinc (Zn)	2015/10/27		86	%	70 - 130
4246784	N_R	MS/MSD RPD		Back Half Antimony (Sb)	2015/10/27	0		%	20
				Back Half Arsenic (As)	2015/10/27	2.2		%	20
				Back Half Barium (Ba)	2015/10/27	1.0		%	20
				Back Half Beryllium (Be)	2015/10/27	0		%	20
				Back Half Cadmium (Cd)	2015/10/27	1.1		%	20
				Back Half Chromium (Cr)	2015/10/27	2.0		%	20
				Back Half Cobalt (Co)	2015/10/27	2.0		%	20
				Back Half Copper (Cu)	2015/10/27	2.1		%	20
				Back Half Lead (Pb)	2015/10/27	0		%	20
				Back Half Manganese (Mn)	2015/10/27	2.1		%	20
				Back Half Nickel (Ni)	2015/10/27	2.0		%	20
				Back Half Selenium (Se)	2015/10/27	2.4		%	20
				Back Half Silver (Ag)	2015/10/27	0		%	20
				Back Half Zinc (Zn)	2015/10/27	0		%	20
4246784	N_R	Spiked Blank		Back Half Antimony (Sb)	2015/10/27		98	%	85 - 115
				Back Half Arsenic (As)	2015/10/27		97	%	85 - 115
				Back Half Barium (Ba)	2015/10/27		100	%	85 - 115
				Back Half Beryllium (Be)	2015/10/27		97	%	85 - 115
				Back Half Cadmium (Cd)	2015/10/27		96	%	85 - 115

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4246784	N_R	Spiked Blank DUP	Back Half Chromium (Cr)	2015/10/27		100	%	85 - 115
			Back Half Cobalt (Co)	2015/10/27		102	%	85 - 115
			Back Half Copper (Cu)	2015/10/27		100	%	85 - 115
			Back Half Lead (Pb)	2015/10/27		99	%	85 - 115
			Back Half Manganese (Mn)	2015/10/27		98	%	85 - 115
			Back Half Nickel (Ni)	2015/10/27		100	%	85 - 115
			Back Half Selenium (Se)	2015/10/27		92	%	85 - 115
			Back Half Silver (Ag)	2015/10/27		103	%	85 - 115
			Back Half Zinc (Zn)	2015/10/27		94	%	85 - 115
			Back Half Antimony (Sb)	2015/10/27		99	%	85 - 115
			Back Half Arsenic (As)	2015/10/27		99	%	85 - 115
			Back Half Barium (Ba)	2015/10/27		100	%	85 - 115
			Back Half Beryllium (Be)	2015/10/27		99	%	85 - 115
			Back Half Cadmium (Cd)	2015/10/27		98	%	85 - 115
			Back Half Chromium (Cr)	2015/10/27		101	%	85 - 115
			Back Half Cobalt (Co)	2015/10/27		103	%	85 - 115
			Back Half Copper (Cu)	2015/10/27		101	%	85 - 115
			Back Half Lead (Pb)	2015/10/27		102	%	85 - 115
			Back Half Manganese (Mn)	2015/10/27		100	%	85 - 115
			Back Half Nickel (Ni)	2015/10/27		102	%	85 - 115
4246784	N_R	RPD	Back Half Selenium (Se)	2015/10/27		94	%	85 - 115
			Back Half Silver (Ag)	2015/10/27		102	%	85 - 115
			Back Half Zinc (Zn)	2015/10/27		96	%	85 - 115
			Back Half Antimony (Sb)	2015/10/27	0.89		%	20
			Back Half Arsenic (As)	2015/10/27	1.6		%	20
			Back Half Barium (Ba)	2015/10/27	0.74		%	20
			Back Half Beryllium (Be)	2015/10/27	2.1		%	20
			Back Half Cadmium (Cd)	2015/10/27	2.2		%	20
			Back Half Chromium (Cr)	2015/10/27	1.2		%	20
			Back Half Cobalt (Co)	2015/10/27	1.2		%	20
			Back Half Copper (Cu)	2015/10/27	1.1		%	20
			Back Half Lead (Pb)	2015/10/27	3.5		%	20
			Back Half Manganese (Mn)	2015/10/27	2.1		%	20
			Back Half Nickel (Ni)	2015/10/27	1.9		%	20
			Back Half Selenium (Se)	2015/10/27	2.4		%	20
			Back Half Silver (Ag)	2015/10/27	1.2		%	20
			Back Half Zinc (Zn)	2015/10/27	1.6		%	20
4246784	N_R	Method Blank	Back Half Antimony (Sb)	2015/10/27	<0.20		ug	
			Back Half Arsenic (As)	2015/10/27	<0.20		ug	
			Back Half Barium (Ba)	2015/10/27	<1.5		ug	
			Back Half Beryllium (Be)	2015/10/27	<0.050		ug	
			Back Half Cadmium (Cd)	2015/10/27	<0.050		ug	
			Back Half Chromium (Cr)	2015/10/27	<0.15		ug	
			Back Half Cobalt (Co)	2015/10/27	<0.050		ug	
			Back Half Copper (Cu)	2015/10/27	<2.0		ug	
			Back Half Lead (Pb)	2015/10/27	<0.10		ug	
			Back Half Manganese (Mn)	2015/10/27	<0.25		ug	
			Back Half Nickel (Ni)	2015/10/27	<0.25		ug	
			Back Half Selenium (Se)	2015/10/27	<0.50		ug	
			Back Half Silver (Ag)	2015/10/27	<0.10		ug	
			Back Half Zinc (Zn)	2015/10/27	<2.5		ug	
4246784	N_R	RPD - Sample/Sample Dup	Back Half Antimony (Sb)	2015/10/27	1.4		%	20
			Back Half Arsenic (As)	2015/10/27	0.56		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4247327	N_R	Spiked Blank	Back Half Barium (Ba)	2015/10/27	NC		%	20
			Back Half Beryllium (Be)	2015/10/27	NC		%	20
			Back Half Cadmium (Cd)	2015/10/27	NC		%	20
			Back Half Chromium (Cr)	2015/10/27	0.78		%	20
			Back Half Cobalt (Co)	2015/10/27	0.77		%	20
			Back Half Copper (Cu)	2015/10/27	NC		%	20
			Back Half Lead (Pb)	2015/10/27	0.12		%	20
			Back Half Manganese (Mn)	2015/10/27	1.7		%	20
			Back Half Nickel (Ni)	2015/10/27	2.4		%	20
			Back Half Selenium (Se)	2015/10/27	NC		%	20
			Back Half Silver (Ag)	2015/10/27	NC		%	20
			Back Half Zinc (Zn)	2015/10/27	NC		%	20
			Total Antimony (Sb)	2015/10/27		98	%	85 - 115
			Total Arsenic (As)	2015/10/27		97	%	85 - 115
			Total Barium (Ba)	2015/10/27		100	%	85 - 115
			Total Beryllium (Be)	2015/10/27		97	%	85 - 115
			Total Cadmium (Cd)	2015/10/27		96	%	85 - 115
			Total Chromium (Cr)	2015/10/27		100	%	85 - 115
			Total Cobalt (Co)	2015/10/27		102	%	85 - 115
			Total Copper (Cu)	2015/10/27		100	%	85 - 115
			Total Lead (Pb)	2015/10/27		99	%	85 - 115
			Total Manganese (Mn)	2015/10/27		98	%	85 - 115
			Total Nickel (Ni)	2015/10/27		100	%	85 - 115
			Total Selenium (Se)	2015/10/27		92	%	85 - 115
			Total Silver (Ag)	2015/10/27		103	%	85 - 115
			Total Zinc (Zn)	2015/10/27		94	%	85 - 115
4247327	N_R	Spiked Blank DUP	Total Antimony (Sb)	2015/10/27		99	%	85 - 115
			Total Arsenic (As)	2015/10/27		99	%	85 - 115
			Total Barium (Ba)	2015/10/27		100	%	85 - 115
			Total Beryllium (Be)	2015/10/27		99	%	85 - 115
			Total Cadmium (Cd)	2015/10/27		98	%	85 - 115
			Total Chromium (Cr)	2015/10/27		101	%	85 - 115
			Total Cobalt (Co)	2015/10/27		103	%	85 - 115
			Total Copper (Cu)	2015/10/27		101	%	85 - 115
			Total Lead (Pb)	2015/10/27		102	%	85 - 115
			Total Manganese (Mn)	2015/10/27		100	%	85 - 115
			Total Nickel (Ni)	2015/10/27		102	%	85 - 115
			Total Selenium (Se)	2015/10/27		94	%	85 - 115
			Total Silver (Ag)	2015/10/27		102	%	85 - 115
			Total Zinc (Zn)	2015/10/27		96	%	85 - 115
4247327	N_R	RPD	Total Antimony (Sb)	2015/10/27	0.89		%	20
			Total Arsenic (As)	2015/10/27	1.6		%	20
			Total Barium (Ba)	2015/10/27	0.74		%	20
			Total Beryllium (Be)	2015/10/27	2.1		%	20
			Total Cadmium (Cd)	2015/10/27	2.2		%	20
			Total Chromium (Cr)	2015/10/27	1.2		%	20
			Total Cobalt (Co)	2015/10/27	1.2		%	20
			Total Copper (Cu)	2015/10/27	1.1		%	20
			Total Lead (Pb)	2015/10/27	3.5		%	20
			Total Manganese (Mn)	2015/10/27	2.1		%	20
			Total Nickel (Ni)	2015/10/27	1.9		%	20
			Total Selenium (Se)	2015/10/27	2.4		%	20
			Total Silver (Ag)	2015/10/27	1.2		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4247327	N_R	Method Blank	Total Zinc (Zn)	2015/10/27	1.6		%	20
			Total Antimony (Sb)	2015/10/27	<0.010		ug/mL	
			Total Arsenic (As)	2015/10/27	<0.010		ug/mL	
			Total Barium (Ba)	2015/10/27	<0.060		ug/mL	
			Total Beryllium (Be)	2015/10/27	<0.0020		ug/mL	
			Total Cadmium (Cd)	2015/10/27	<0.0020		ug/mL	
			Total Chromium (Cr)	2015/10/27	<0.0050		ug/mL	
			Total Cobalt (Co)	2015/10/27	<0.0020		ug/mL	
			Total Copper (Cu)	2015/10/27	<0.010		ug/mL	
			Total Lead (Pb)	2015/10/27	<0.0050		ug/mL	
			Total Manganese (Mn)	2015/10/27	<0.010		ug/mL	
			Total Nickel (Ni)	2015/10/27	<0.010		ug/mL	
			Total Selenium (Se)	2015/10/27	<0.020		ug/mL	
			Total Silver (Ag)	2015/10/27	<0.0050		ug/mL	
			Total Zinc (Zn)	2015/10/27	<0.050		ug/mL	
4248555	N_R	Matrix Spike(BEC552)	Front Half Antimony (Sb)	2015/10/28		103	%	70 - 130
			Front Half Arsenic (As)	2015/10/28		96	%	70 - 130
			Front Half Barium (Ba)	2015/10/28		101	%	70 - 130
			Front Half Beryllium (Be)	2015/10/28		96	%	70 - 130
			Front Half Cadmium (Cd)	2015/10/28		100	%	70 - 130
			Front Half Chromium (Cr)	2015/10/28		96	%	70 - 130
			Front Half Cobalt (Co)	2015/10/28		98	%	70 - 130
			Front Half Copper (Cu)	2015/10/28		95	%	70 - 130
			Front Half Lead (Pb)	2015/10/28		94	%	70 - 130
			Front Half Manganese (Mn)	2015/10/28		98	%	70 - 130
			Front Half Nickel (Ni)	2015/10/28		95	%	70 - 130
			Front Half Selenium (Se)	2015/10/28		98	%	70 - 130
			Front Half Silver (Ag)	2015/10/28		100	%	70 - 130
			Front Half Zinc (Zn)	2015/10/28		101	%	70 - 130
4248555	N_R	Matrix Spike DUP(BEC552)	Front Half Antimony (Sb)	2015/10/28		107	%	70 - 130
			Front Half Arsenic (As)	2015/10/28		98	%	70 - 130
			Front Half Barium (Ba)	2015/10/28		102	%	70 - 130
			Front Half Beryllium (Be)	2015/10/28		95	%	70 - 130
			Front Half Cadmium (Cd)	2015/10/28		103	%	70 - 130
			Front Half Chromium (Cr)	2015/10/28		98	%	70 - 130
			Front Half Cobalt (Co)	2015/10/28		100	%	70 - 130
			Front Half Copper (Cu)	2015/10/28		96	%	70 - 130
			Front Half Lead (Pb)	2015/10/28		96	%	70 - 130
			Front Half Manganese (Mn)	2015/10/28		99	%	70 - 130
			Front Half Nickel (Ni)	2015/10/28		98	%	70 - 130
			Front Half Selenium (Se)	2015/10/28		99	%	70 - 130
			Front Half Silver (Ag)	2015/10/28		102	%	70 - 130
			Front Half Zinc (Zn)	2015/10/28		103	%	70 - 130
4248555	N_R	MS/MSD RPD	Front Half Antimony (Sb)	2015/10/28	3.8		%	20
			Front Half Arsenic (As)	2015/10/28	2.1		%	20
			Front Half Barium (Ba)	2015/10/28	0.99		%	20
			Front Half Beryllium (Be)	2015/10/28	1.0		%	20
			Front Half Cadmium (Cd)	2015/10/28	3.0		%	20
			Front Half Chromium (Cr)	2015/10/28	2.1		%	20
			Front Half Cobalt (Co)	2015/10/28	2.0		%	20
			Front Half Copper (Cu)	2015/10/28	1.0		%	20
			Front Half Lead (Pb)	2015/10/28	2.1		%	20
			Front Half Manganese (Mn)	2015/10/28	1.0		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4248555	N_R	Spiked Blank	Front Half Nickel (Ni)	2015/10/28	3.1		%	20
			Front Half Selenium (Se)	2015/10/28	1.0		%	20
			Front Half Silver (Ag)	2015/10/28	2.0		%	20
			Front Half Zinc (Zn)	2015/10/28	2.0		%	20
			Front Half Antimony (Sb)	2015/10/28		98	%	85 - 115
			Front Half Arsenic (As)	2015/10/28		99	%	85 - 115
			Front Half Barium (Ba)	2015/10/28		97	%	85 - 115
			Front Half Beryllium (Be)	2015/10/28		102	%	85 - 115
			Front Half Cadmium (Cd)	2015/10/28		97	%	85 - 115
			Front Half Chromium (Cr)	2015/10/28		101	%	85 - 115
			Front Half Cobalt (Co)	2015/10/28		104	%	85 - 115
			Front Half Copper (Cu)	2015/10/28		101	%	85 - 115
			Front Half Lead (Pb)	2015/10/28		102	%	85 - 115
			Front Half Manganese (Mn)	2015/10/28		102	%	85 - 115
			Front Half Nickel (Ni)	2015/10/28		102	%	85 - 115
			Front Half Selenium (Se)	2015/10/28		99	%	85 - 115
			Front Half Silver (Ag)	2015/10/28		103	%	85 - 115
			Front Half Zinc (Zn)	2015/10/28		104	%	85 - 115
4248555	N_R	Spiked Blank DUP	Front Half Antimony (Sb)	2015/10/28		99	%	85 - 115
			Front Half Arsenic (As)	2015/10/28		100	%	85 - 115
			Front Half Barium (Ba)	2015/10/28		97	%	85 - 115
			Front Half Beryllium (Be)	2015/10/28		100	%	85 - 115
			Front Half Cadmium (Cd)	2015/10/28		97	%	85 - 115
			Front Half Chromium (Cr)	2015/10/28		100	%	85 - 115
			Front Half Cobalt (Co)	2015/10/28		104	%	85 - 115
			Front Half Copper (Cu)	2015/10/28		101	%	85 - 115
			Front Half Lead (Pb)	2015/10/28		100	%	85 - 115
			Front Half Manganese (Mn)	2015/10/28		101	%	85 - 115
			Front Half Nickel (Ni)	2015/10/28		101	%	85 - 115
			Front Half Selenium (Se)	2015/10/28		98	%	85 - 115
			Front Half Silver (Ag)	2015/10/28		102	%	85 - 115
			Front Half Zinc (Zn)	2015/10/28		104	%	85 - 115
4248555	N_R	RPD	Front Half Antimony (Sb)	2015/10/28	0.70		%	20
			Front Half Arsenic (As)	2015/10/28	0.42		%	20
			Front Half Barium (Ba)	2015/10/28	0.054		%	20
			Front Half Beryllium (Be)	2015/10/28	1.9		%	20
			Front Half Cadmium (Cd)	2015/10/28	0.28		%	20
			Front Half Chromium (Cr)	2015/10/28	0.39		%	20
			Front Half Cobalt (Co)	2015/10/28	0.76		%	20
			Front Half Copper (Cu)	2015/10/28	0.036		%	20
			Front Half Lead (Pb)	2015/10/28	2.0		%	20
			Front Half Manganese (Mn)	2015/10/28	1.5		%	20
			Front Half Nickel (Ni)	2015/10/28	0.79		%	20
			Front Half Selenium (Se)	2015/10/28	0.45		%	20
			Front Half Silver (Ag)	2015/10/28	1.1		%	20
			Front Half Zinc (Zn)	2015/10/28	0.21		%	20
4248555	N_R	Method Blank	Front Half Antimony (Sb)	2015/10/28	<0.40		ug	
			Front Half Arsenic (As)	2015/10/28	<0.40		ug	
			Front Half Barium (Ba)	2015/10/28	3.5,		ug	
					RDL=3.0			
			Front Half Beryllium (Be)	2015/10/28	<0.10		ug	
			Front Half Cadmium (Cd)	2015/10/28	<0.10		ug	
			Front Half Chromium (Cr)	2015/10/28	<0.30		ug	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Front Half Cobalt (Co)	2015/10/28	<0.10		ug	
			Front Half Copper (Cu)	2015/10/28	<2.0		ug	
			Front Half Lead (Pb)	2015/10/28	<0.20		ug	
			Front Half Manganese (Mn)	2015/10/28	<0.75		ug	
			Front Half Nickel (Ni)	2015/10/28	<0.50		ug	
			Front Half Selenium (Se)	2015/10/28	<1.0		ug	
			Front Half Silver (Ag)	2015/10/28	<0.20		ug	
			Front Half Zinc (Zn)	2015/10/28	<5.0		ug	
4248555	N_R	RPD - Sample/Sample Dup	Front Half Antimony (Sb)	2015/10/28	1.2		%	20
			Front Half Arsenic (As)	2015/10/28	0.91		%	20
			Front Half Barium (Ba)	2015/10/28	NC		%	20
			Front Half Beryllium (Be)	2015/10/28	NC		%	20
			Front Half Cadmium (Cd)	2015/10/28	NC		%	20
			Front Half Chromium (Cr)	2015/10/28	5.0		%	20
			Front Half Cobalt (Co)	2015/10/28	1.7		%	20
			Front Half Copper (Cu)	2015/10/28	2.0		%	20
			Front Half Lead (Pb)	2015/10/28	1.8		%	20
			Front Half Manganese (Mn)	2015/10/28	3.2		%	20
			Front Half Nickel (Ni)	2015/10/28	1.4		%	20
			Front Half Selenium (Se)	2015/10/28	NC		%	20
			Front Half Silver (Ag)	2015/10/28	NC		%	20
			Front Half Zinc (Zn)	2015/10/28	1.2		%	20
4248561	N_R	Matrix Spike(BEC578)	Front Half Antimony (Sb)	2015/10/28		100	%	70 - 130
			Front Half Arsenic (As)	2015/10/28		97	%	70 - 130
			Front Half Barium (Ba)	2015/10/28		100	%	70 - 130
			Front Half Beryllium (Be)	2015/10/28		96	%	70 - 130
			Front Half Cadmium (Cd)	2015/10/28		98	%	70 - 130
			Front Half Chromium (Cr)	2015/10/28		99	%	70 - 130
			Front Half Cobalt (Co)	2015/10/28		100	%	70 - 130
			Front Half Copper (Cu)	2015/10/28		99	%	70 - 130
			Front Half Lead (Pb)	2015/10/28		99	%	70 - 130
			Front Half Manganese (Mn)	2015/10/28		100	%	70 - 130
			Front Half Nickel (Ni)	2015/10/28		98	%	70 - 130
			Front Half Selenium (Se)	2015/10/28		98	%	70 - 130
			Front Half Silver (Ag)	2015/10/28		98	%	70 - 130
			Front Half Zinc (Zn)	2015/10/28		102	%	70 - 130
4248561	N_R	Matrix Spike DUP(BEC578)	Front Half Antimony (Sb)	2015/10/28		99	%	70 - 130
			Front Half Arsenic (As)	2015/10/28		98	%	70 - 130
			Front Half Barium (Ba)	2015/10/28		100	%	70 - 130
			Front Half Beryllium (Be)	2015/10/28		97	%	70 - 130
			Front Half Cadmium (Cd)	2015/10/28		97	%	70 - 130
			Front Half Chromium (Cr)	2015/10/28		100	%	70 - 130
			Front Half Cobalt (Co)	2015/10/28		101	%	70 - 130
			Front Half Copper (Cu)	2015/10/28		99	%	70 - 130
			Front Half Lead (Pb)	2015/10/28		96	%	70 - 130
			Front Half Manganese (Mn)	2015/10/28		100	%	70 - 130
			Front Half Nickel (Ni)	2015/10/28		100	%	70 - 130
			Front Half Selenium (Se)	2015/10/28		99	%	70 - 130
			Front Half Silver (Ag)	2015/10/28		98	%	70 - 130
			Front Half Zinc (Zn)	2015/10/28		101	%	70 - 130
4248561	N_R	MS/MSD RPD	Front Half Antimony (Sb)	2015/10/28	1.0		%	20
			Front Half Arsenic (As)	2015/10/28	1.0		%	20
			Front Half Barium (Ba)	2015/10/28	0		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4248561	N_R	Spiked Blank	Front Half Beryllium (Be)	2015/10/28	1.0		%	20
			Front Half Cadmium (Cd)	2015/10/28	1.0		%	20
			Front Half Chromium (Cr)	2015/10/28	1.0		%	20
			Front Half Cobalt (Co)	2015/10/28	1.0		%	20
			Front Half Copper (Cu)	2015/10/28	0		%	20
			Front Half Lead (Pb)	2015/10/28	3.1		%	20
			Front Half Manganese (Mn)	2015/10/28	0		%	20
			Front Half Nickel (Ni)	2015/10/28	2.0		%	20
			Front Half Selenium (Se)	2015/10/28	1.0		%	20
			Front Half Silver (Ag)	2015/10/28	0		%	20
			Front Half Zinc (Zn)	2015/10/28	0.99		%	20
			Front Half Antimony (Sb)	2015/10/28		100	%	85 - 115
			Front Half Arsenic (As)	2015/10/28		100	%	85 - 115
			Front Half Barium (Ba)	2015/10/28		100	%	85 - 115
			Front Half Beryllium (Be)	2015/10/28		96	%	85 - 115
			Front Half Cadmium (Cd)	2015/10/28		97	%	85 - 115
			Front Half Chromium (Cr)	2015/10/28		101	%	85 - 115
			Front Half Cobalt (Co)	2015/10/28		102	%	85 - 115
			Front Half Copper (Cu)	2015/10/28		101	%	85 - 115
			Front Half Lead (Pb)	2015/10/28		102	%	85 - 115
			Front Half Manganese (Mn)	2015/10/28		102	%	85 - 115
			Front Half Nickel (Ni)	2015/10/28		100	%	85 - 115
			Front Half Selenium (Se)	2015/10/28		99	%	85 - 115
			Front Half Silver (Ag)	2015/10/28		101	%	85 - 115
			Front Half Zinc (Zn)	2015/10/28		100	%	85 - 115
			Front Half Antimony (Sb)	2015/10/28		100	%	85 - 115
			Front Half Arsenic (As)	2015/10/28		99	%	85 - 115
			Front Half Barium (Ba)	2015/10/28		99	%	85 - 115
			Front Half Beryllium (Be)	2015/10/28		96	%	85 - 115
			Front Half Cadmium (Cd)	2015/10/28		97	%	85 - 115
			Front Half Chromium (Cr)	2015/10/28		100	%	85 - 115
			Front Half Cobalt (Co)	2015/10/28		101	%	85 - 115
			Front Half Copper (Cu)	2015/10/28		100	%	85 - 115
			Front Half Lead (Pb)	2015/10/28		100	%	85 - 115
			Front Half Manganese (Mn)	2015/10/28		101	%	85 - 115
			Front Half Nickel (Ni)	2015/10/28		99	%	85 - 115
			Front Half Selenium (Se)	2015/10/28		99	%	85 - 115
			Front Half Silver (Ag)	2015/10/28		101	%	85 - 115
			Front Half Zinc (Zn)	2015/10/28		100	%	85 - 115
4248561	N_R	RPD	Front Half Antimony (Sb)	2015/10/28	0.46		%	20
			Front Half Arsenic (As)	2015/10/28	0.52		%	20
			Front Half Barium (Ba)	2015/10/28	0.31		%	20
			Front Half Beryllium (Be)	2015/10/28	0.039		%	20
			Front Half Cadmium (Cd)	2015/10/28	0.15		%	20
			Front Half Chromium (Cr)	2015/10/28	1.5		%	20
			Front Half Cobalt (Co)	2015/10/28	0.80		%	20
			Front Half Copper (Cu)	2015/10/28	0.96		%	20
			Front Half Lead (Pb)	2015/10/28	1.4		%	20
			Front Half Manganese (Mn)	2015/10/28	1.0		%	20
			Front Half Nickel (Ni)	2015/10/28	0.69		%	20
			Front Half Selenium (Se)	2015/10/28	0.40		%	20
			Front Half Silver (Ag)	2015/10/28	0.83		%	20
			Front Half Zinc (Zn)	2015/10/28	0.30		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4248561	N_R	Method Blank	Front Half Antimony (Sb)	2015/10/28	<0.40			ug	
			Front Half Arsenic (As)	2015/10/28	<0.40		ug		
			Front Half Barium (Ba)	2015/10/28	4.3,		ug		
					RDL=3.0				
			Front Half Beryllium (Be)	2015/10/28	<0.10		ug		
			Front Half Cadmium (Cd)	2015/10/28	<0.10		ug		
			Front Half Chromium (Cr)	2015/10/28	<0.30		ug		
			Front Half Cobalt (Co)	2015/10/28	<0.10		ug		
			Front Half Copper (Cu)	2015/10/28	<2.0		ug		
			Front Half Lead (Pb)	2015/10/28	<0.20		ug		
			Front Half Manganese (Mn)	2015/10/28	<0.75		ug		
			Front Half Nickel (Ni)	2015/10/28	<0.50		ug		
			Front Half Selenium (Se)	2015/10/28	<1.0		ug		
			Front Half Silver (Ag)	2015/10/28	<0.20		ug		
			Front Half Zinc (Zn)	2015/10/28	6.3,		ug		
					RDL=5.0				
4248561	N_R	RPD - Sample/Sample Dup	Front Half Antimony (Sb)	2015/10/28	0.80		%	20	
			Front Half Arsenic (As)	2015/10/28	NC		%	20	
			Front Half Barium (Ba)	2015/10/28	NC		%	20	
			Front Half Beryllium (Be)	2015/10/28	NC		%	20	
			Front Half Cadmium (Cd)	2015/10/28	4.5		%	20	
			Front Half Chromium (Cr)	2015/10/28	NC		%	20	
			Front Half Cobalt (Co)	2015/10/28	NC		%	20	
			Front Half Copper (Cu)	2015/10/28	0.92		%	20	
			Front Half Lead (Pb)	2015/10/28	0.30		%	20	
			Front Half Manganese (Mn)	2015/10/28	NC		%	20	
			Front Half Nickel (Ni)	2015/10/28	2.3		%	20	
			Front Half Selenium (Se)	2015/10/28	NC		%	20	
			Front Half Silver (Ag)	2015/10/28	NC		%	20	
			Front Half Zinc (Zn)	2015/10/28	NC		%	20	
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.									
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.									
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.									
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.									
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).									

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ralph Siebert, Operations Manager - Inorganic Analyses

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



October 30, 2015

Jenna Ghanma
Mostardi Platt
888 Industrial Drive
Elmhurst, IL 60123

Enclosed is your final report for ERA's Stationary Source Audit Sample (SSAS) Program. Your final report includes an evaluation of all results submitted by your laboratory to ERA.

Data Evaluation Protocols: All analytes in ERA's SSAS Program have been evaluated comparing the reported result to the acceptance limits generated using the criteria contained in the TNI SSAS Table.

For any "Not Acceptable" results, please contact your state regulator for any corrective action requirements.

Thank you for your participation in ERA's SSAS Program. If you have any questions, please contact our Proficiency Testing Department at 1-800-372-0122.

Sincerely,

David Kilhefner
Quality Officer

cc: Project File Number 0929150



A Waters Company

Recipient Type	Report Recipient	Contact	Project ID
Agency	IL-EPA Region 5 (SSAS) 77 W Jackson Blvd AE-17J Chicago, IL 60604 USA	Dakota Prentice prentice.dakota@epa.gov Phone: 312-886-6761	
Facility	Behr Iron And Metal 1100 Seminary St Rockford, IL 61104 USA	John Pinion jpinion@rka-inc.com Phone: 630-393-9000	
Lab	Maxxam Analytics Inc 6740 Campobello Rd Mississauga, ON L5N 2L8 Canada	Clayton Johnson Sr. Project Manager cjohnson@maxxam.ca Phone: (905) 817-5769	
Tester	Mostardi Platt 888 Industrial Drive Elmhurst, IL 60123 USA	Jenna Ghanma jghanma@mp-mail.com Phone: 630-993-2685	Behr M154005

ISO/IEC 17043:2016



Project # : 0929150





A Waters Company

0929150 Laboratory Exception Report

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

Evaluation Checks

There are no values reported with < where the assigned value was greater than 0.

Not Acceptable Evaluations

There were no Not Acceptable evaluations for this study.





A Waters Company

Final Report Results For Laboratory Maxxam Analytics Inc



A Waters Company

SSAP Evaluation Report

Project Number: **0929150**

ERA Customer Number: **M748564**

Laboratory Name: **Maxxam Analytics Inc**

Inorganic Results



0929150 Evaluation Final Complete Report

A Waters Company

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Metals on Filter Paper (cat# 1425, lot# 0929150) Study Dates: 09/29/15 - 10/30/15									
1005	Antimony	µg/Filter	32.2	31.9	23.9 - 39.9	Acceptable	EPA Method 29 2000	10/28/2015	
1010	Arsenic	µg/Filter	26.4	27.3	20.5 - 34.1	Acceptable	EPA Method 29 2000	10/28/2015	
1015	Barium	µg/Filter	31.4	27.2	20.4 - 34.0	Acceptable	EPA Method 29 2000	10/28/2015	
1020	Beryllium	µg/Filter	12.5	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1030	Cadmium	µg/Filter	13.2	13.6	10.9 - 16.3	Acceptable	EPA Method 29 2000	10/28/2015	
1040	Chromium	µg/Filter	21.0	20.4	16.3 - 24.5	Acceptable	EPA Method 29 2000	10/28/2015	
1050	Cobalt	µg/Filter	14.6	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1055	Copper	µg/Filter	14.2	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1075	Lead	µg/Filter	27.4	27.2	21.8 - 32.6	Acceptable	EPA Method 29 2000	10/28/2015	
1090	Manganese	µg/Filter	14.5	13.6	9.52 - 17.7	Acceptable	EPA Method 29 2000	10/28/2015	
1105	Nickel	µg/Filter	27.1	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	
1140	Selenium	µg/Filter	26.9	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	
1150	Silver	µg/Filter	40.8	40.8	28.6 - 53.0	Acceptable	EPA Method 29 2000	10/28/2015	
1165	Thallium	µg/Filter		40.8	30.6 - 51.0	Not Reported			
1190	Zinc	µg/Filter	29.0	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	





0929150 Evaluation Final Complete Report

A Waters Company

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Metals in Impinger Solution (cat# 1426, lot# 0929150) Study Dates: 09/29/15 - 10/30/15									
1005	Antimony	µg/mL	1.78	1.70	1.28 - 2.12	Acceptable	EPA Method 29 2000	10/27/2015	
1010	Arsenic	µg/mL	0.902	0.895	0.671 - 1.12	Acceptable	EPA Method 29 2000	10/27/2015	
1015	Barium	µg/mL	1.10	1.05	0.788 - 1.31	Acceptable	EPA Method 29 2000	10/27/2015	
1020	Beryllium	µg/mL	1.45	1.35	1.01 - 1.69	Acceptable	EPA Method 29 2000	10/27/2015	
1030	Cadmium	µg/mL	1.17	1.12	0.896 - 1.34	Acceptable	EPA Method 29 2000	10/27/2015	
1040	Chromium	µg/mL	2.51	2.42	1.94 - 2.90	Acceptable	EPA Method 29 2000	10/27/2015	
1050	Cobalt	µg/mL	1.96	1.75	1.31 - 2.19	Acceptable	EPA Method 29 2000	10/27/2015	
1055	Copper	µg/mL	1.29	1.22	0.915 - 1.52	Acceptable	EPA Method 29 2000	10/27/2015	
1075	Lead	µg/mL	0.719	0.695	0.521 - 0.869	Acceptable	EPA Method 29 2000	10/27/2015	
1090	Manganese	µg/mL	0.343	0.326	0.244 - 0.408	Acceptable	EPA Method 29 2000	10/27/2015	
1105	Nickel	µg/mL	0.372	0.357	0.286 - 0.428	Acceptable	EPA Method 29 2000	10/27/2015	
1140	Selenium	µg/mL	1.81	1.80	1.35 - 2.25	Acceptable	EPA Method 29 2000	10/27/2015	
1150	Silver	µg/mL	0.878	0.818	0.614 - 1.02	Acceptable	EPA Method 29 2000	10/27/2015	
1165	Thallium	µg/mL		1.59	1.19 - 1.99	Not Reported			
1190	Zinc	µg/mL	1.74	1.64	1.23 - 2.05	Acceptable	EPA Method 29 2000	10/27/2015	



Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Project Number: M154005
Test Location: Foundry Sand Separator

Test Method: 5/29
Filterable Analysis Date: 10/14/2015

Filter Drying Temp °F: Ambient-Des. 24 hrs.
Analyst: JMG

Description	Sample Date	ID#	vol. (ml)	Initial Weight (grams)	Final Weight (grams)	Net Weight Gain (grams)
Filterable Particulate						
Test No. 1	10/6/2015					
Source Condition: Normal						
M5 Filter		8754		0.4453	2.2531	1.8078
Acetone Wash (Teflon Baggies)		574	54 ml	1.3122	1.5704	0.2582
Acetone Blank						0.0002
Total Front Half Weight						2.0658
Filterable Particulate						
Test No. 2	10/6/2015					
Source Condition: Normal						
M5 Filter		8753		0.4413	1.5678	1.1265
Acetone Wash (Teflon Baggies)		575	44 ml	1.3151	1.5588	0.2437
Acetone Blank						0.0002
Total Front Half Weight						1.3700
Filterable Particulate						
Test No. 3	10/6/2015					
Source Condition: Normal						
M5 Filter		8719		0.4371	1.1156	0.6785
Acetone Wash (Teflon Baggies)		576	65 ml	1.3310	1.5405	0.2095
Acetone Blank						0.0003
Total Front Half Weight						0.8877
Reagent Blank Summary						
Acetone Wash (Teflon Baggies)		569	100 ml	1.3126	1.3130	0.0004

Client: **Rk & Associates, Inc.**
 Facility: **Behr Iron and Metal Rockford Facility**
 Project Number: **M154005**
 Test Location: **Northwest Baghouse Gas Cooler Inlet**

Test Method: **5/29**
 Filterable Analysis Date: **10/14/2015**

Filter Drying Temp °F: **Ambient-Des. 24 hrs**
 Analyst: **JMG**

Description	Sample Date	ID#	vol. (ml)	Initial Weight (grams)	Final Weight (grams)	Net Weight Gain (grams)
Filterable Particulate						
Test No. 1	10/6/2015					
Source Condition: Normal						
M5 Filter		8758		0.4418	0.4687	0.0269
Acetone Wash (Teflon Baggies)		577	38 ml	1.3485	1.3633	0.0148
Acetone Blank						0.0002
Total Front Half Weight						0.0415
Filterable Particulate						
Test No. 2	10/6/2015					
Source Condition: Normal						
M5 Filter		8757		0.4430	0.4666	0.0236
Acetone Wash (Teflon Baggies)		578	32 ml	1.3338	1.3390	0.0052
Acetone Blank						0.0001
Total Front Half Weight						0.0287
Filterable Particulate						
Test No. 3	10/6/2015					
Source Condition: Normal						
M5 Filter		8759		0.4406	0.4453	0.0047
Acetone Wash (Teflon Baggies)		579	28 ml	1.3458	1.3554	0.0096
Acetone Blank						0.0001
Total Front Half Weight						0.0142
Reagent Blank Summary						
Acetone Wash (Teflon Baggies)		569	100 ml	1.3126	1.3130	0.0004

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Project Number: M154005
 Test Location: Northwest Baghouse Outlet Stack

Test Method: 5/29
 Filterable Analysis Date: 10/14/2015

Filter Drying Temp °F: Ambient-Des. 24 hrs
 Analyst: JMG

Description	Sample Date	ID#	vol. (ml)	Initial Weight (grams)	Final Weight (grams)	Net Weight Gain (grams)
Filterable Particulate						
Test No. 1	10/6/2015					
Source Condition: Normal						
M5 Filter		8752		0.4423	0.4495	0.0072
Acetone Wash (Teflon Baggies)		571	86 ml	1.2952	1.2994	0.0042
Acetone Blank						0.0003
Total Front Half Weight						0.0111
Filterable Particulate						
Test No. 2	10/6/2015					
Source Condition: Normal						
M5 Filter		8755		0.4395	0.4410	0.0015
Acetone Wash (Teflon Baggies)		572	32 ml	1.3688	1.3787	0.0099
Acetone Blank						0.0001
Total Front Half Weight						0.0113
Filterable Particulate						
Test No. 3	10/6/2015					
Source Condition: Normal						
M5 Filter		8735		0.4410	0.4443	0.0033
Acetone Wash (Teflon Baggies)		573	45 ml	1.3502	1.3587	0.0085
Acetone Blank						0.0002
Total Front Half Weight						0.0116
Reagent Blank Summary						
Acetone Wash (Teflon Baggies)		569	100 ml	1.3126	1.3130	0.0004

Appendix E- Reference Method Test Data (Computerized Sheets)

Client:	Rk & Associates, Inc.		
Facility:	Behr Iron and Metal Rockford Facility		
Test Location:	Foundry Sand Separator		
Project #:	M154005		
Test Method:	5/29		
Test Engineer:	MLIP		
Test Technician:	NCC		
	<u>R1</u>	<u>R2</u>	<u>R3</u>
Temp ID:	CM33	CM33	CM33
Meter ID:	CM33	CM33	CM33
Pitot ID:	256	256	256
Nozzle Diameter (Inches):	0.310	0.310	0.300
Meter Calibration Factor (Y):	1.003	1.003	1.003
Meter Orifice Setting (Delta H):	1.748	1.748	1.748
Nozzle Kit ID Number and Material:	Glass #7	Glass #7	Glass #7
Pitot Tube Coefficient:		0.840	
Probe Length (Feet):		3.0	
Probe Liner Material:		Glass	
Sample Plane:		Horizontal	
Port Length (Inches):		0.00	
Port Size (Diameter, Inches):		6.00	
Port Type:		Hole in duct	
Duct Shape:		Circular	
Diameter (Feet):		1.3333	
Duct Area (Square Feet):		1.396	
Upstream Diameters:		>.5	
Downstream Diameters:		>2	
Number of Ports Sampled:		2	
Number of Points per Port:		12	
Minutes per Point:		5.0	
Minutes per Reading:		5.0	
Total Number of Traverse Points:		24	
Test Length (Minutes):		120	
Train Type:		Anderson Box	
Source Condition:		Normal	
Servomex Serial Number:		01440D1/3935	
Moisture Balance ID:		S10-37	
# of Runs		3	

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Foundry Sand Separator
Test Method: 5/29

Source Condition:		Normal Run 1	Normal Run 2	Normal Run 3
Identify Analyte:	Antimony (Sb)			
Molecular Weight:	121.75	ADL	ADL	ADL
ug (net) collected:		241	219.35	137
Identify Analyte:	Arsenic (As)			
Molecular Weight:	74.92	ADL	ADL	ADL
ug (net) collected:		12	11.8	7.3
Identify Analyte:	Barium (Ba)			
Molecular Weight:	137.33	ADL	ADL	ADL
ug (net) collected:		109.9	105.5	67.3
Identify Analyte:	Beryllium (Be)			
Molecular Weight:	9.01	BDL	BDL	BDL
ug (net) collected:		0.55	0.55	0.55
Identify Analyte:	Cadmium (Cd)			
Molecular Weight:	112.4	ADL	ADL	ADL
ug (net) collected:		10.847	9.441	9.952
Identify Analyte:	Chromium (Cr)			
Molecular Weight:	51.99	ADL	ADL	ADL
ug (net) collected:		73.75	52.05	42.39
Identify Analyte:	Cobalt (Co)			
Molecular Weight:	58.93	ADL	ADL	ADL
ug (net) collected:		57.964	40.031	24.379
Identify Analyte:	Copper (Cu)			
Molecular Weight:	63.55	ADL	ADL	ADL
ug (net) collected:		30602.2	17002.8	10105.3
Identify Analyte:	Lead (Pb)			
Molecular Weight:	207.19	ADL	ADL	ADL
ug (net) collected:		20901.22	16302.75	10500.84
Identify Analyte:	Manganese (Mn)			
Molecular Weight:	54.94	ADL	ADL	ADL
ug (net) collected:		825.59	581.19	359.99
Identify Analyte:	Nickel (Ni)			
Molecular Weight:	58.71	ADL	ADL	ADL
ug (net) collected:		332.8	229.84	176.46

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Test Method: 5/29

Source Condition:		Normal Run 1	Normal Run 2	Normal Run 3
Identify Analyte:	Selenium (Se)			
Molecular Weight:	78.96	DLL	DLL	BDL
ug (net) collected:		5.65	17.7	5.5
Identify Analyte:	Silver (Ag)			
Molecular Weight:	107.87	ADL	ADL	ADL
ug (net) collected:		11.96	8.12	9.6
Identify Analyte:	Zinc (Zn)			
Molecular Weight:	65.37	ADL	ADL	ADL
ug (net) collected:		8991.9	7762.4	4913.1

Run 1-Method 5/29

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Source Condition: Normal

Date: 10/6/15
 Start Time: 11:40
 End Time: 13:52

DRY GAS METER CONDITIONS				STACK CONDITIONS		
	ΔH :	2.16	in. H ₂ O	Static Pressure	-2.00	in. H ₂ O
Meter Temperature, Tm:	64.6	°F		Flue Pressure (Ps):	29.25	in. Hg. abs.
Sqrt ΔP :	0.472	in. H ₂ O		Carbon Dioxide:	0.00	%
Stack Temperature, Ts:	67.2	°F		Oxygen:	20.90	%
Meter Volume, Vm:	97.682	ft ³		Nitrogen:	79.10	%
Meter Volume, Vmstd:	97.410	dscf		Gas Weight dry, Md:	28.836	lb/lb mole
Meter Volume, Vwstd:	1.163	wscf		Gas Weight wet, Ms:	28.708	lb/lb mole
Isokinetic Variance:	99.4	%I		Excess Air:	---	%
Test Length	120.00	in mins.		Gas Velocity, Vs:	26.842	fps
Nozzle Diameter	0.310	in inches		Volumetric Flow:	2,249	acfm
Barometric Pressure	29.40	in Hg		Volumetric Flow:	2,176	dscfm
Calculated Fo:	#DIV/0!			Volumetric Flow:	2,202	scfm
				Fo Validity:	#DIV/0!	

MOISTURE DETERMINATION

Initial Impinger Content:	2005.7	ml	Silica Initial Wt.	833.3	grams
Final Impinger Content:	2005.9	ml	Silica Final Wt.	857.8	grams
Impinger Difference:	0.2	ml	Silica Difference:	24.5	grams
Total Water Gain:	24.7		Moisture, Bws:	0.012	
			Supersaturation Value, Bws:	0.023	

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	11:40:00	0.20	1.88	15.230	64	61	62	0.447	3.850	25.445
2	11:45:00	0.22	2.08	19.080	68	62	63	0.469	4.120	26.687
3	11:50:00	0.20	1.88	23.200	63	63	63	0.447	3.790	25.445
4	11:55:00	0.20	1.88	26.990	63	63	63	0.447	3.830	25.445
5	12:00:00	0.18	1.70	30.820	69	63	63	0.424	3.490	24.139
6	12:05:00	0.18	1.70	34.310	72	65	63	0.424	3.830	24.139
7	12:10:00	0.25	2.36	38.140	79	64	63	0.500	4.310	28.448
8	12:15:00	0.28	2.64	42.450	82	65	64	0.529	4.530	30.107
9	12:20:00	0.24	2.26	46.980	82	65	64	0.490	4.230	27.873
10	12:25:00	0.28	2.64	51.210	80	66	64	0.529	4.400	30.107
11	12:30:00	0.45	4.25	55.610	80	67	64	0.671	5.670	38.167
12	12:35:00	0.45	4.25	61.280	80	66	64	0.671	5.953	38.167
	12:40:00			67.233						
2-1	12:52:00	0.16	1.51	67.233	70	64	65	0.400	3.497	22.758
2	12:57:00	0.18	1.70	70.730	64	65	65	0.424	3.380	24.139
3	13:02:00	0.18	1.70	74.110	64	66	64	0.424	4.070	24.139
4	13:07:00	0.15	1.41	78.180	60	65	64	0.387	3.340	22.036
5	13:12:00	0.12	1.13	81.520	57	67	62	0.346	2.970	19.709
6	13:17:00	0.15	1.41	84.490	58	67	63	0.387	3.450	22.036
7	13:22:00	0.20	1.88	87.940	59	67	65	0.447	3.870	25.445
8	13:27:00	0.30	2.83	91.810	59	67	65	0.548	4.520	31.163
9	13:32:00	0.24	2.26	96.330	59	67	65	0.490	4.150	27.873
10	13:37:00	0.30	2.83	100.480	60	68	65	0.548	4.840	31.163
11	13:42:00	0.18	1.70	105.320	60	68	65	0.424	4.010	24.139
12	13:47:00	0.20	1.88	109.330	60	69	65	0.447	3.582	25.445
	13:52:00			112.912						

Total	2:00:00			97.682		65.4	63.9		97.682	
Average			2.16		67.2	64.6		0.472		
Min			1.13		57.0	61.0		0.346		
Max			4.25		82.0	69.0		0.671		

Run 2-Method 5/29

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Source Condition: Normal

Date: 10/6/15
 Start Time: 14:40
 End Time: 16:52

DRY GAS METER CONDITIONS				STACK CONDITIONS		
	ΔH :	2.41	In. H ₂ O	Static Pressure	-2.00	in. H ₂ O
Meter Temperature, Tm:	71.5	°F		Flue Pressure (Ps):	29.25	in. Hg. abs.
Sqrt ΔP :	0.486	In. H ₂ O		Carbon Dioxide:	0.00	%
Stack Temperature, Ts:	66.5	°F		Oxygen:	20.90	%
Meter Volume, Vm:	103.146	ft ³		Nitrogen:	79.1	%
Meter Volume, Vmstd:	101.603	dscf		Gas Weight dry, Md:	28.836	lb/lb mole
Meter Volume, Vwstd:	1.192	wscf		Gas Weight wet, Ms:	28.710	lb/lb mole
Isokinetic Variance:	100.7	%I		Excess Air:		%
				Gas Velocity, Vs:	27.603	fps
Test Length	120.00	in mins.		Volumetric Flow:	2,312	acfm
Nozzle Diameter	0.310	in inches		Volumetric Flow:	2,241	dscfm
Barometric Pressure	29.40	in Hg		Volumetric Flow:	2,267	scfm
Calculated Fo:	#DIV/0!			Fo Validity:	#DIV/0!	

MOISTURE DETERMINATION

Initial Impinger Content:	2102.3	ml	Silica Initial Wt.	859.1	grams
Final Impinger Content:	2109.0	ml	Silica Final Wt.	877.7	grams
Impinger Difference:	6.7	ml	Silica Difference:	18.6	grams
Total Water Gain:	25.3		Moisture, Bws:	0.012	
			Supersaturation Value, Bws:	0.022	

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	14:40:00	0.18	1.72	114.905	67	69	71	0.424	3.795	24.122
2	14:45:00	0.16	1.52	118.700	68	69	71	0.400	3.620	22.742
3	14:50:00	0.15	1.43	122.320	64	70	72	0.387	3.340	22.020
4	14:55:00	0.15	1.43	125.660	64	70	72	0.387	3.280	22.020
5	15:00:00	0.10	0.95	128.940	65	70	71	0.316	3.030	17.979
6	15:05:00	0.12	1.14	131.970	65	71	70	0.346	2.850	19.695
7	15:10:00	0.22	2.10	134.820	66	71	70	0.469	4.340	26.668
8	15:15:00	0.35	3.34	139.160	66	71	70	0.592	5.060	33.636
9	15:20:00	0.35	3.34	144.220	66	72	71	0.592	5.230	33.636
10	15:25:00	0.33	3.15	149.450	67	72	71	0.574	5.060	32.661
11	15:30:00	0.45	4.30	154.510	67	72	70	0.671	5.870	38.140
12	15:35:00	0.43	4.10	160.380	67	73	70	0.656	5.800	37.283
	15:40:00			166.180						
2-1	15:52:00	0.15	1.43	166.180	73	71	73	0.387	3.530	22.020
2	15:57:00	0.20	1.91	169.710	73	72	72	0.447	4.010	25.427
3	16:02:00	0.20	1.91	173.720	71	72	72	0.447	3.800	25.427
4	16:07:00	0.18	1.72	177.520	70	72	72	0.424	3.830	24.122
5	16:12:00	0.18	1.91	181.350	68	72	72	0.424	4.060	24.122
6	16:17:00	0.14	1.33	185.410	66	72	72	0.374	2.980	21.273
7	16:22:00	0.15	1.43	188.390	65	72	72	0.387	3.320	22.020
8	16:27:00	0.16	1.52	191.710	63	72	72	0.400	4.070	22.742
9	16:32:00	0.18	1.72	195.780	63	72	72	0.424	3.770	24.122
10	16:37:00	0.49	4.68	199.550	63	72	72	0.700	6.260	39.799
11	16:42:00	0.51	4.87	205.810	64	74	72	0.714	6.140	40.603
12	16:47:00	0.50	4.77	211.950	64	73	72	0.707	6.101	40.203
	16:52:00			218.051						

Total	2:00:00			103.146		71.5	71.4		103.146	
Average			2.41		66.5	71.5		0.486		
Min			0.95		63.0	69.0		0.316		
Max			4.87		73.0	74.0		0.714		

Run 3-Method 5/29

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Foundry Sand Separator
 Source Condition: Normal

Date: 10/6/15
 Start Time: 17:40
 End Time: 19:51

DRY GAS METER CONDITIONS				STACK CONDITIONS		
ΔH :	1.68	In. H ₂ O		Static Pressure	-2.00	in. H ₂ O
Meter Temperature, T _m :	70.3	°F		Flue Pressure (Ps):	29.25	in. Hg. abs.
Sqrt ΔP :	0.467	In. H ₂ O		Carbon Dioxide:	0.00	%
Stack Temperature, T _s :	50.3	°F		Oxygen:	20.90	%
Meter Volume, V _m :	87.476	ft ³		Nitrogen:	79.1	%
Meter Volume, V _{mstd} :	86.208	dscf		Gas Weight dry, M _d :	28.836	lb/lb mole
Meter Volume, V _{wstd} :	1.404	wscf		Gas Weight wet, M _s :	28.695	lb/lb mole
Isokinetic Variance:	93.5	%I		Excess Air:		%
Test Length	120.00	in mins.		Gas Velocity, V _s :	26.149	fps
Nozzle Diameter	0.300	in inches		Volumetric Flow:	2,191	acfm
Barometric Pressure	29.40	in Hg		Volumetric Flow:	2,187	dscfm
Calculated Fo:	#DIV/0!			Volumetric Flow:	2,216	scfm
				Fo Validity:	#DIV/0!	

MOISTURE DETERMINATION

Initial Impinger Content:	2016.8	ml	Silica Initial Wt.	839.6	grams
Final Impinger Content:	2029.7	ml	Silica Final Wt.	856.5	grams
Impinger Difference:	12.9	ml	Silica Difference:	16.9	grams
Total Water Gain:	29.8		Moisture, Bws:	0.016	
			Supersaturation Value, Bws:	0.013	

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	17:40:00	0.21	1.93	221.074	64	70	72	0.458	4.036	25.659
2	17:45:00	0.22	2.02	225.110	55	70	72	0.469	3.680	26.263
3	17:50:00	0.21	1.93	228.790	48	72	71	0.458	4.130	25.659
4	17:55:00	0.21	1.93	232.920	49	73	71	0.458	3.980	25.659
5	18:00:00	0.20	1.83	236.900	49	73	70	0.447	3.870	25.041
6	18:05:00	0.18	1.65	240.770	49	73	70	0.424	3.650	23.756
7	18:10:00	0.18	1.65	244.420	49	74	72	0.424	3.600	23.756
8	18:15:00	0.26	2.38	248.020	49	74	72	0.510	4.440	28.551
9	18:20:00	2.25	2.29	252.460	49	73	71	1.500	4.250	83.989
10	18:25:00	0.11	1.01	256.710	49	73	71	0.332	2.940	18.571
11	18:30:00	0.15	1.37	259.650	49	73	71	0.387	2.950	21.686
12	18:35:00	0.14	1.28	262.600	49	73	70	0.374	3.280	20.951
	18:40:00			265.880						
2-1	18:51:00	0.17	1.56	265.880	50	69	69	0.412	3.620	23.086
2	18:56:00	0.14	1.28	269.500	50	69	68	0.374	3.210	20.951
3	19:01:00	0.15	1.37	272.710	50	70	69	0.387	3.310	21.686
4	19:06:00	0.14	1.28	276.020	50	70	69	0.374	3.390	20.951
5	19:11:00	0.14	1.28	279.410	50	70	69	0.374	2.940	20.951
6	19:16:00	0.15	1.37	282.350	50	70	69	0.387	3.510	21.686
7	19:21:00	0.26	2.29	285.860	50	70	69	0.510	4.460	28.551
8	19:26:00	0.25	2.29	290.320	50	69	67	0.500	4.430	27.996
9	19:31:00	0.11	1.01	294.750	50	69	67	0.332	2.690	18.571
10	19:36:00	0.22	2.02	297.440	50	69	67	0.469	3.980	26.263
11	19:41:00	0.21	1.93	301.420	50	69	66	0.458	3.840	25.659
12	19:46:00	0.15	1.37	305.260	50	69	66	0.387	3.290	21.686
	19:51:00			308.550						

Total	2:00:00			87.476		71.0	69.5		87.476	
Average			1.68		50.3	70.3		0.467		
Min			1.01		48.0	66.0		0.332		
Max			2.38		64.0	74.0		1.500		

Client:	Rk & Associates, Inc.		
Facility:	Behr Iron and Metal Rockford Facility		
Test Location:	Northwest Baghouse Gas Cooler Inlet		
Project #:	M154005		
Test Method:	5/29		
Test Engineer:	BRS		
Test Technician:	DJK		
	<u>R1</u>	<u>R2</u>	<u>R3</u>
Temp ID:	CM26	CM26	CM26
Meter ID:	CM26	CM26	CM26
Pitot ID:	170	170	170
Nozzle Diameter (Inches):	0.234	0.242	0.242
Meter Calibration Factor (Y):	0.990	0.990	0.990
Meter Orifice Setting (Delta H):	1.702	1.702	1.702
Nozzle Kit ID Number and Material:	Glass 1/Teflon 7		
Pitot Tube Coefficient:	0.840		
Probe Length (Feet):	5.0		
Probe Liner Material:	Glass		
Sample Plane:	Horizontal		
Port Length (Inches):	6.00		
Port Size (Diameter, Inches):	6.00		
Port Type:	Nipple		
Duct Shape:	Circular		
Diameter (Feet):	2.75		
Duct Area (Square Feet):	5.940		
Upstream Diameters:	>.5		
Downstream Diameters:	>2		
Number of Ports Sampled:	2		
Number of Points per Port:	20		
Minutes per Point:	3.0		
Minutes per Reading:	3.0		
Total Number of Traverse Points:	40		
Test Length (Minutes):	120		
Train Type:	Anderson Box		
Source Condition:	Normal		
Servomex Serial Number:	01440D1/3935		
Moisture Balance ID:	S10-37		
# of Runs	3		

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Northwest Baghouse Gas Cooler Inlet
Test Method: 5/29

Source Condition:		Normal Run 1	Normal Run 2	Normal Run 3
Identify Analyte:	Antimony (Sb)			
Molecular Weight:	121.75	ADL	ADL	ADL
ug (net) collected:		150	49.2	33
Identify Analyte:	Arsenic (As)			
Molecular Weight:	74.92	ADL	ADL	ADL
ug (net) collected:		19.12	87.4	21.87
Identify Analyte:	Barium (Ba)			
Molecular Weight:	137.33	ADL	DLL	ADL
ug (net) collected:		54.4	16.7	15.2
Identify Analyte:	Beryllium (Be)			
Molecular Weight:	9.01	BDL	BDL	BDL
ug (net) collected:		0.55	0.55	0.25
Identify Analyte:	Cadmium (Cd)			
Molecular Weight:	112.4	ADL	ADL	ADL
ug (net) collected:		1.513	4.212	3.162
Identify Analyte:	Chromium (Cr)			
Molecular Weight:	51.99	ADL	ADL	ADL
ug (net) collected:		46.22	33.35	19.71
Identify Analyte:	Cobalt (Co)			
Molecular Weight:	58.93	ADL	ADL	ADL
ug (net) collected:		44.863	21.051	11.784
Identify Analyte:	Copper (Cu)			
Molecular Weight:	63.55	ADL	ADL	ADL
ug (net) collected:		1044.1	231.9	157.8
Identify Analyte:	Lead (Pb)			
Molecular Weight:	207.19	ADL	ADL	ADL
ug (net) collected:		4271.74	810.67	536.71
Identify Analyte:	Manganese (Mn)			
Molecular Weight:	54.94	ADL	ADL	ADL
ug (net) collected:		65.61	17.87	12.01
Identify Analyte:	Nickel (Ni)			
Molecular Weight:	58.71	ADL	ADL	ADL
ug (net) collected:		466.46	469.58	202.95

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Northwest Baghouse Gas Cooler Inlet
Test Method: 5/29

Source Condition:		Normal Run 1	Normal Run 2	Normal Run 3
Identify Analyte:	Selenium (Se)			
Molecular Weight:	78.96	DLL	BDL	DLL
ug (net) collected:		5.72	5.5	3.05
Identify Analyte:	Silver (Ag)			
Molecular Weight:	107.87	DLL	BDL	BDL
ug (net) collected:		1.1	1.1	0.5
Identify Analyte:	Zinc (Zn)			
Molecular Weight:	65.37	ADL	ADL	ADL
ug (net) collected:		547.9	158.3	110.6

Run 1-Method 5/29

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Northwest Baghouse Gas Cooler Inlet
 Source Condition: Normal

Date: 10/6/15
 Start Time: 11:40
 End Time: 13:52

DRY GAS METER CONDITIONS

ΔH : 1.51 in. H₂O
 Meter Temperature, T_m: 67.4 °F
 Sqrt ΔP : 0.702 in. H₂O
 Stack Temperature, T_s: 94.2 °F
 Meter Volume, V_m: 78.677 ft³
 Meter Volume, V_{mstd}: 76.881 dscf
 Meter Volume, V_{wstd}: 1.083 wscf
 Isokinetic Variance: 94.9 %I
 Test Length 120.00 in mins.
 Nozzle Diameter 0.234 in inches
 Barometric Pressure 29.39 in Hg
 Calculated Fo: 1.00

STACK CONDITIONS

Static Pressure -0.50 in. H₂O
 Flue Pressure (Ps): 29.35 in. Hg. abs.
 Carbon Dioxide: 0.10 %
 Oxygen: 20.80 %
 Nitrogen: 79.10 %
 Gas Weight dry, M_d: 28.848 lb/lb mole
 Gas Weight wet, M_s: 28.697 lb/lb mole
 Excess Air: — %
 Gas Velocity, V_s: 40.889 fps
 Volumetric Flow: 14,572 acfm
 Volumetric Flow: 13,432 dscfm
 Volumetric Flow: 13,621 scfm
 Fo Validity: #N/A

MOISTURE DETERMINATION

Initial Impinger Content: 1955.0 ml
 Final Impinger Content: 1956.2 ml
 Impinger Difference: 1.2 ml
 Silica Initial Wt. 828.0 grams
 Silica Final Wt. 849.8 grams
 Silica Difference: 21.8 grams

Total Water Gain: 23.0 Moisture, Bws: 0.014 Supersaturation Value, Bws: 0.055

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	11:40:00	1.10	2.20	32.518	90	60	60	1.049	2.522	61.088
1-2	11:43:00	1.50	3.00	35.040	91	65	65	1.225	2.960	71.335
1-3	11:46:00	1.60	3.20	38.000	89	65	65	1.265	3.075	73.675
1-4	11:49:00	0.91	1.80	41.075	90	65	65	0.954	2.310	55.562
1-5	11:52:00	0.88	1.80	43.385	100	65	65	0.938	2.245	54.639
1-6	11:55:00	0.75	1.50	45.630	107	65	65	0.866	2.070	50.442
1-7	11:58:00	0.72	1.40	47.700	107	67	66	0.849	2.040	49.423
1-8	12:01:00	0.52	1.00	49.740	109	68	66	0.721	1.720	42.001
1-9	12:04:00	0.38	0.75	51.460	112	68	66	0.616	1.465	35.905
1-10	12:07:00	0.26	0.53	52.925	95	68	66	0.510	1.230	29.699
1-11	12:10:00	0.28	0.57	54.155	93	69	66	0.529	1.295	30.820
1-12	12:13:00	0.30	0.61	55.450	93	69	66	0.548	1.320	31.902
1-13	12:16:00	0.29	0.60	56.770	91	69	66	0.539	1.318	31.366
1-14	12:19:00	0.30	0.61	58.088	90	69	66	0.548	1.327	31.902
1-15	12:22:00	0.27	0.56	59.415	90	69	66	0.520	1.265	30.265
1-16	12:25:00	0.26	0.53	60.680	90	69	66	0.510	1.245	29.699
1-17	12:28:00	0.25	0.51	61.925	90	69	66	0.500	1.210	29.123
1-18	12:31:00	0.18	0.37	63.135	90	69	66	0.424	1.030	24.711
1-19	12:34:00	0.20	0.41	64.165	83	69	66	0.447	1.095	26.048
1-20	12:37:00	0.24	0.50	65.260	74	67	66	0.490	1.210	28.534
	12:40:00			66.470						
2-1	12:52:00	0.72	2.50	66.470	96	67	66	0.849	2.710	49.423
2-2	12:55:00	0.88	3.10	69.180	96	67	66	0.938	2.970	54.639
2-3	12:58:00	1.00	3.50	72.150	100	68	66	1.000	3.175	58.245
2-4	13:01:00	1.10	3.80	75.325	107	68	66	1.049	3.308	61.088
2-5	13:04:00	1.10	3.80	78.633	109	68	66	1.049	3.287	61.088
2-6	13:07:00	0.94	3.20	81.920	111	69	66	0.970	3.052	56.471
2-7	13:10:00	0.71	2.50	84.972	94	69	66	0.843	2.688	49.078
2-8	13:13:00	0.66	2.30	87.660	97	70	67	0.812	2.590	47.319
2-9	13:16:00	0.63	2.20	90.250	100	70	67	0.794	2.525	46.231

2-10	13:19:00	0.62	2.20	92.775	98	70	67	0.787	2.510	45.862
2-11	13:22:00	0.33	1.20	95.285	93	70	67	0.574	1.845	33.459
2-12	13:25:00	0.28	0.99	97.130	93	71	67	0.529	1.682	30.820
2-13	13:28:00	0.28	0.99	98.812	93	71	67	0.529	1.711	30.820
2-14	13:31:00	0.25	0.88	100.523	93	71	67	0.500	1.592	29.123
2-15	13:34:00	0.20	0.71	102.115	93	71	67	0.447	1.425	26.048
2-16	13:37:00	0.25	0.89	103.540	90	72	68	0.500	1.610	29.123
2-17	13:40:00	0.23	0.82	105.150	88	72	69	0.480	1.540	27.933
2-18	13:43:00	0.20	0.72	106.690	83	72	69	0.447	1.450	26.048
2-19	13:46:00	0.20	0.73	108.140	80	72	69	0.447	1.460	26.048
2-20	13:49:00	0.24	0.88	109.600	78	72	69	0.490	1.595	28.534
	13:52:00			111.195						

Total	2:00:00			78.677		68.6	66.3		78.677	
Average			1.51		94.2	67.4		0.702		
Min			0.37		74.0	60.0		0.424		
Max			3.80		112.0	72.0		1.265		

Run 2-Method 5/29

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Northwest Baghouse Gas Cooler Inlet
 Source Condition: Normal

Date: 10/6/15
 Start Time: 14:40
 End Time: 16:52

DRY GAS METER CONDITIONS			STACK CONDITIONS		
ΔH :	1.91	In. H ₂ O	Static Pressure	-0.50	in. H ₂ O
Meter Temperature, Tm:	75.7	°F	Flue Pressure (Ps):	29.35	in. Hg. abs.
Sqrt ΔP :	0.708	In. H ₂ O	Carbon Dioxide:	0.10	%
Stack Temperature, Ts:	93.6	°F	Oxygen:	20.80	%
Meter Volume, Vm:	93.547	ft ³	Nitrogen:	79.1	%
Meter Volume, Vmstd:	90.097	dscf	Gas Weight dry, Md:	28.848	lb/lb mole
Meter Volume, Vwstd:	1.149	wscf	Gas Weight wet, Ms:	28.711	lb/lb mole
Isokinetic Variance:	103.0	%I	Excess Air:	---	%
Test Length	120.00	in mins.	Gas Velocity, Vs:	41.193	fps
Nozzle Diameter	0.242	in inches	Volumetric Flow:	14,680	acfm
Barometric Pressure	29.39	in Hg	Volumetric Flow:	13,563	dscfm
Calculated Fo:	1.00		Volumetric Flow:	13,736	scfm
			Fo Validity:	#N/A	

MOISTURE DETERMINATION

Initial Impinger Content:	2171.5	ml	Silica Initial Wt.	820.0	grams
Final Impinger Content:	2177.6	ml	Silica Final Wt.	838.3	grams
Impinger Difference:	6.1	ml	Silica Difference:	18.3	grams
Total Water Gain:	24.4		Moisture, Bws:	0.013	
			Supersaturation Value, Bws:	0.054	

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	14:40:00	1.10	3.90	11.928	96	69	69	1.049	3.352	61.043
1-2	14:43:00	0.85	3.00	15.280	96	71	69	0.922	2.950	53.660
1-3	14:46:00	0.81	2.90	18.230	95	73	70	0.900	2.890	52.382
1-4	14:49:00	0.62	2.20	21.120	96	74	70	0.787	2.530	45.829
1-5	14:52:00	1.00	3.50	23.650	92	74	70	1.000	3.225	58.202
1-6	14:55:00	0.98	3.50	26.875	92	74	71	0.990	3.195	57.618
1-7	14:58:00	0.41	1.40	30.070	97	74	71	0.640	2.057	37.268
1-8	15:01:00	0.77	2.80	32.127	93	73	71	0.877	2.828	51.072
1-9	15:04:00	0.74	2.80	34.955	93	73	71	0.860	2.770	50.068
1-10	15:07:00	0.82	2.20	37.725	93	73	71	0.787	2.530	45.829
1-11	15:10:00	0.34	1.20	40.255	94	73	71	0.583	1.875	33.938
1-12	15:13:00	0.32	1.10	42.130	100	73	71	0.566	1.814	32.924
1-13	15:16:00	0.33	1.20	43.944	100	73	71	0.574	1.833	33.435
1-14	15:19:00	0.35	1.20	45.777	91	75	71	0.592	1.913	34.433
1-15	15:22:00	0.30	1.20	47.690	94	75	71	0.548	1.772	31.879
1-16	15:25:00	0.26	0.92	49.462	98	75	71	0.510	1.628	29.678
1-17	15:28:00	0.22	0.77	51.090	100	76	72	0.469	1.510	27.299
1-18	15:31:00	0.20	0.70	52.600	102	76	72	0.447	1.440	26.029
1-19	15:34:00	0.21	0.75	54.040	90	77	73	0.458	1.493	26.672
1-20	15:37:00	0.20	0.73	55.533	85	77	74	0.447	1.449	26.029
	15:40:00	0.23	0.84	56.982	80	77	74	0.480	0.000	27.913
2-1	15:52:00	1.10	3.90	56.982	87	73	73	1.049	4.506	61.043
2-2	15:55:00	1.00	3.60	61.488	89	80	73	1.000	3.262	58.202
2-3	15:58:00	0.97	3.30	64.750	90	81	73	0.985	3.215	57.323
2-4	16:01:00	0.92	3.30	67.965	90	81	74	0.959	3.125	55.826
2-5	16:04:00	0.85	3.00	71.090	93	82	74	0.922	3.008	53.660
2-6	16:07:00	0.74	2.70	74.098	93	83	75	0.860	2.802	50.068
2-7	16:10:00	0.64	2.30	76.900	93	83	75	0.800	2.621	46.562
2-8	16:13:00	0.52	1.90	79.521	94	83	75	0.721	2.345	41.970
2-9	16:16:00	0.35	1.20	81.866	96	82	75	0.592	1.922	34.433

2-10	16:19:00	0.28	1.00	83.788	96	82	75	0.529	1.712	30.798
2-11	16:22:00	0.40	1.40	85.500	96	83	76	0.632	2.370	36.810
2-12	16:25:00	0.46	1.60	87.870	97	82	77	0.678	1.895	39.475
2-13	16:28:00	0.47	1.70	89.765	97	82	77	0.686	2.235	39.902
2-14	16:31:00	0.44	1.60	92.000	97	82	77	0.663	2.165	38.607
2-15	16:34:00	0.40	1.40	94.165	97	83	78	0.632	2.050	36.810
2-16	16:37:00	0.36	1.30	96.215	94	82	79	0.600	1.965	34.921
2-17	16:40:00	0.37	1.30	98.180	91	82	79	0.608	1.990	35.403
2-18	16:43:00	0.35	1.30	100.170	91	82	79	0.592	1.940	34.433
2-19	16:46:00	0.33	1.20	102.110	90	83	79	0.574	1.885	33.435
2-20	16:49:00	0.20	0.73	103.995	90	83	79	0.447	1.480	26.029
	16:52:00			105.475						

Total	2:00:00			93.547		77.8	73.6		93.547	
Average			1.91		93.6	75.7		0.708		
Min			0.70		80.0	69.0		0.447		
Max			3.90		102.0	83.0		1.049		

Run 3-Method 5/29

Client: Rk & Associates, Inc.

Facility: Behr Iron and Metal Rockford Facility

Test Location: Northwest Baghouse Gas Cooler Inlet

Source Condition: Normal

Date: 10/6/15

Start Time: 17:35

End Time: 19:51

DRY GAS METER CONDITIONS

ΔH :	2.04	in. H ₂ O
Meter Temperature, Tm:	75.5	°F
Sqrt ΔP :	0.737	in. H ₂ O
Stack Temperature, Ts:	101.4	°F
Meter Volume, Vm:	94.878	ft ³
Meter Volume, Vmstd:	91.445	dscf
Meter Volume, Vwstd:	1.535	wscf
Isokinetic Variance:	101.5	%I
Test Length	120.00	in mins.
Nozzle Diameter	0.242	in inches
Barometric Pressure	29.39	in Hg
Calculated Fo:	1.00	

STACK CONDITIONS

Static Pressure	-0.50	in. H ₂ O
Flue Pressure (Ps):	29.35	in. Hg. abs.
Carbon Dioxide:	0.10	%
Oxygen:	20.80	%
Nitrogen:	79.1	%
Gas Weight dry, Md:	28.848	lb/lb mole
Gas Weight wet, Ms:	28.669	lb/lb mole
Excess Air:	---	%
Gas Velocity, Vs:	43.201	fps
Volumetric Flow:	15,396	acfm
Volumetric Flow:	13,971	dscfm
Volumetric Flow:	14,206	scfm
Fo Validity:	#N/A	

MOISTURE DETERMINATION

Initial Impinger Content:	1942.9	ml	Silica Initial Wt.	823.2	grams
Final Impinger Content:	1954.2	ml	Silica Final Wt.	844.5	grams
Impinger Difference:	11.3	ml	Silica Difference:	21.3	grams

Total Water Gain: 32.6

Moisture, Bws: 0.017

Supersaturation Value, Bws: 0.069

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	17:35:00	1.20	4.20	8.487	105	79	79	1.095	3.568	64.252
1-2	17:38:00	1.30	4.60	12.055	99	80	79	1.140	3.680	66.876
1-3	17:41:00	1.10	3.90	15.735	98	80	78	1.049	3.410	61.517
1-4	17:44:00	0.90	3.10	19.145	100	81	78	0.949	3.085	55.644
1-5	17:47:00	0.86	3.10	22.230	99	81	78	0.927	3.010	54.393
1-6	17:50:00	0.70	2.50	25.240	99	81	78	0.837	2.705	49.073
1-7	17:53:00	0.55	2.00	27.945	98	80	77	0.742	2.405	43.499
1-8	17:56:00	0.35	1.20	30.350	98	80	77	0.592	1.925	34.700
1-9	17:59:00	0.33	1.20	32.275	101	81	76	0.574	1.885	33.694
1-10	18:02:00	0.23	0.82	34.160	98	81	76	0.480	1.525	28.129
1-11	18:05:00	0.30	1.10	35.685	97	80	76	0.548	1.795	32.126
1-12	18:08:00	0.32	1.10	37.480	97	80	76	0.566	1.820	33.180
1-13	18:11:00	0.38	1.30	39.300	98	78	75	0.616	1.995	36.157
1-14	18:14:00	0.37	1.30	41.295	98	78	75	0.608	1.970	35.678
1-15	18:17:00	0.34	1.20	43.265	95	77	74	0.583	1.875	34.201
1-16	18:20:00	0.36	1.30	45.140	96	77	74	0.600	1.945	35.192
1-17	18:23:00	0.30	1.10	47.085	96	77	74	0.548	1.790	32.126
1-18	18:26:00	0.30	1.10	48.875	98	77	74	0.548	1.750	32.126
1-19	18:29:00	0.28	1.00	50.625	98	77	74	0.529	1.715	31.037
1-20	18:32:00	0.25	0.89	52.340	98	77	74	0.500	1.610	29.327
	18:35:00			53.950						
2-1	18:51:00	0.88	3.10	53.950	96	71	71	0.938	3.015	55.022
2-2	18:54:00	0.89	3.10	56.965	96	73	71	0.943	3.025	55.334
2-3	18:57:00	1.10	3.40	59.990	92	75	71	1.049	3.395	61.517
2-4	19:00:00	1.10	3.40	63.385	92	75	71	1.049	3.380	61.517
2-5	19:03:00	1.00	3.50	66.765	96	76	71	1.000	3.227	58.654
2-6	19:06:00	1.00	3.50	69.992	95	76	71	1.000	3.223	58.654
2-7	19:09:00	0.98	3.50	73.215	93	76	71	0.990	3.210	58.064
2-8	19:12:00	0.94	3.30	76.425	93	77	71	0.970	3.130	56.867
2-9	19:15:00	0.80	2.80	79.555	100	77	71	0.894	2.860	52.462

2-10	19:18:00	0.68	2.40	82.415	100	77	71	0.825	2.645	48.367
2-11	19:21:00	0.40	1.40	85.060	112	77	71	0.632	2.015	37.096
2-12	19:24:00	0.35	1.20	87.075	114	77	71	0.592	1.870	34.700
2-13	19:27:00	0.35	1.20	88.945	114	77	71	0.592	1.885	34.700
2-14	19:30:00	0.34	1.20	90.830	115	77	71	0.583	1.850	34.201
2-15	19:33:00	0.29	1.00	92.680	114	77	71	0.539	1.700	31.586
2-16	19:36:00	0.34	1.20	94.380	110	77	71	0.583	1.860	34.201
2-17	19:39:00	0.33	1.10	96.240	119	76	70	0.574	1.810	33.694
2-18	19:42:00	0.32	1.10	98.050	116	75	70	0.566	1.780	33.180
2-19	19:45:00	0.30	1.00	99.830	111	75	70	0.548	1.737	32.126
2-20	19:48:00	0.32	1.10	101.567	112	75	70	0.566	1.798	33.180
	19:51:00			103.365						

Total	2:00:00		94.878	77.5	73.5	94.878
Average		2.04	101.4	75.5		0.737
Min		0.82	92.0	70.0		0.480
Max		4.60	119.0	81.0		1.140

Client:	Rk & Associates, Inc.		
Facility:	Behr Iron and Metal Rockford Facility		
Test Location:	Northwest Baghouse Outlet Stack		
Project #:	M154005		
Test Method:	5/29		
Test Engineer:	MDK		
Test Technician:	KOJ		
	<u>R1</u>	<u>R2</u>	<u>R3</u>
Temp ID:	CM15	CM15	CM15
Meter ID:	CM15	CM15	CM15
Pitot ID:	170A	170A	170A
Nozzle Diameter (Inches):	0.230	0.230	0.230
Meter Calibration Factor (Y):	0.988	0.988	0.988
Meter Orifice Setting (Delta H):	1.488	1.488	1.488
Nozzle Kit ID Number and Material:	Glass #17	Glass #17	Glass #17
Pitot Tube Coefficient:		0.840	
Probe Length (Feet):		4.0	
Probe Liner Material:		Glass	
Sample Plane:		Horizontal	
Port Length (Inches):		8.00	
Port Size (Diameter, Inches):		6.00	
Port Type:		Nipple	
Duct Shape:		Circular	
Diameter (Feet):		2.75	
Duct Area (Square Feet):		5.940	
Upstream Diameters:		>.5	
Downstream Diameters:		>2	
Number of Ports Sampled:		2	
Number of Points per Port:		12	
Minutes per Point:		5.0	
Minutes per Reading:		5.0	
Total Number of Traverse Points:		24	
Test Length (Minutes):		120	
Train Type:		Anderson Box	
Source Condition:		Normal	
Servomex Serial Number:		01440D1/3935	
Moisture Balance ID:		S10-37	
# of Runs		3	

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Northwest Baghouse Outlet Stack
 Test Method: 5/29

Source Condition:		Normal Run 1	Normal Run 2	Normal Run 3
Identify Analyte:	Antimony (Sb)			
Molecular Weight:	121.75	ADL	ADL	ADL
ug (net) collected:		37.6	14.4	13.8
Identify Analyte:	Arsenic (As)			
Molecular Weight:	74.92	ADL	ADL	ADL
ug (net) collected:		34.37	13.47	11.35
Identify Analyte:	Barium (Ba)			
Molecular Weight:	137.33	ADL	ADL	DLL
ug (net) collected:		9	5.7	4.6
Identify Analyte:	Beryllium (Be)			
Molecular Weight:	9.01	BDL	BDL	BDL
ug (net) collected:		0.25	0.25	0.25
Identify Analyte:	Cadmium (Cd)			
Molecular Weight:	112.4	ADL	ADL	ADL
ug (net) collected:		1.063	1.622	2.792
Identify Analyte:	Chromium (Cr)			
Molecular Weight:	51.99	ADL	ADL	ADL
ug (net) collected:		10.28	5.08	4.54
Identify Analyte:	Cobalt (Co)			
Molecular Weight:	58.93	ADL	ADL	ADL
ug (net) collected:		17.972	6.925	6.613
Identify Analyte:	Copper (Cu)			
Molecular Weight:	63.55	ADL	ADL	ADL
ug (net) collected:		349.6	186	284.3
Identify Analyte:	Lead (Pb)			
Molecular Weight:	207.19	ADL	ADL	ADL
ug (net) collected:		796.8	409.53	470.17
Identify Analyte:	Manganese (Mn)			
Molecular Weight:	54.94	ADL	ADL	ADL
ug (net) collected:		15.54	7.74	9.59
Identify Analyte:	Nickel (Ni)			
Molecular Weight:	58.71	ADL	ADL	ADL
ug (net) collected:		72.04	29.98	29.21

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Northwest Baghouse Outlet Stack
Test Method: 5/29

Source Condition:		Normal Run 1	Normal Run 2	Normal Run 3
Identify Analyte:	Selenium (Se)			
Molecular Weight:	78.96	BDL	BDL	BDL
ug (net) collected:		2.5	2.5	2.5
Identify Analyte:	Silver (Ag)			
Molecular Weight:	107.87	DLL	DLL	BDL
ug (net) collected:		0.73	0.53	0.5
Identify Analyte:	Zinc (Zn)			
Molecular Weight:	65.37	ADL	ADL	ADL
ug (net) collected:		357.7	173.2	174.8

Run 1-Method 5/29

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Northwest Baghouse Outlet Stack
 Source Condition: Normal

Date: 10/6/15
 Start Time: 11:40
 End Time: 13:52

DRY GAS METER CONDITIONS

ΔH : 1.36 in. H₂O
 Meter Temperature, T_m: 67.9 °F
 Sqrt ΔP : 0.755 in. H₂O
 Stack Temperature, T_s: 89.6 °F
 Meter Volume, V_m: 86.700 ft³
 Meter Volume, V_{mstd}: 84.471 dscf
 Meter Volume, V_{wstd}: 1.314 wscf
 Isokinetic Variance: 100.3 %I
 Test Length 120.00 in mins.
 Nozzle Diameter 0.230 in inches
 Barometric Pressure 29.40 in Hg
 Calculated Fo: #DIV/0!

STACK CONDITIONS

Static Pressure -2.00 in. H₂O
 Flue Pressure (Ps): 29.25 in. Hg. abs.
 Carbon Dioxide: 0.00 %
 Oxygen: 20.90 %
 Nitrogen: 79.10 %
 Gas Weight dry, M_d: 28.836 lb/lb mole
 Gas Weight wet, M_s: 28.670 lb/lb mole
 Excess Air: %
 Gas Velocity, V_s: 43.866 fps
 Volumetric Flow: 15,633 acfm
 Volumetric Flow: 14,459 dscfm
 Volumetric Flow: 14,684 scfm
 Fo Validity: #DIV/0!

MOISTURE DETERMINATION

Initial Impinger Content: 2092.5 ml
 Final Impinger Content: 2102.1 ml
 Impinger Difference: 9.6 ml
 Silica Initial Wt. 800.2 grams
 Silica Final Wt. 818.5 grams
 Silica Difference: 18.3 grams

Total Water Gain: 27.9

Moisture, Bws: 0.015

Supersaturation Value, Bws: 0.048

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	11:40:00	0.70	1.66	82.541	85	61	62	0.837	3.779	48.636
2	11:45:00	0.70	1.66	86.320	86	63	62	0.837	4.050	48.636
3	11:50:00	0.67	1.59	90.370	88	65	62	0.819	3.170	47.583
4	11:55:00	0.66	1.56	93.540	92	67	62	0.812	3.920	47.226
5	12:00:00	0.62	1.47	97.460	93	68	63	0.787	3.830	45.773
6	12:05:00	0.62	1.47	101.290	94	68	63	0.787	3.790	45.773
7	12:10:00	0.57	1.35	105.080	90	69	63	0.755	3.610	43.888
8	12:15:00	0.53	1.26	108.690	89	70	64	0.728	3.530	42.320
9	12:20:00	0.50	1.19	112.220	88	71	64	0.707	3.400	41.105
10	12:25:00	0.46	1.09	115.620	87	70	64	0.678	3.500	39.427
11	12:30:00	0.46	1.09	119.120	87	70	65	0.678	3.270	39.427
12	12:35:00	0.41	0.98	122.390	87	70	65	0.640	3.217	37.222
	12:40:00			125.607						
2-1	12:52:00	0.69	1.64	125.607	89	70	65	0.831	4.093	48.288
2	12:57:00	0.68	1.62	129.700	90	72	65	0.825	3.950	47.937
3	13:02:00	0.67	1.59	133.650	91	73	66	0.819	3.900	47.583
4	13:07:00	0.64	1.53	137.550	92	74	67	0.800	3.960	46.505
5	13:12:00	0.60	1.43	141.510	91	74	67	0.775	3.700	45.029
6	13:17:00	0.62	1.48	145.210	91	74	67	0.787	3.750	45.773
7	13:22:00	0.56	1.34	148.960	89	75	68	0.748	3.770	43.502
8	13:27:00	0.54	1.29	152.730	89	75	68	0.735	3.460	42.718
9	13:32:00	0.51	1.22	156.190	89	75	68	0.714	3.630	41.514
10	13:37:00	0.49	1.17	159.820	90	75	68	0.700	3.250	40.692
11	13:42:00	0.44	1.05	163.070	92	74	68	0.663	3.550	38.560
12	13:47:00	0.42	1.00	166.620	91	73	68	0.648	2.621	37.674
	13:52:00			169.241						

Total	2:00:00			86.700		70.7	65.2		86.700	
Average			1.36		89.6	67.9		0.755		
Min			0.98		85.0	61.0		0.640		
Max			1.66		94.0	75.0		0.837		

Run 2-Method 5/29

Client: Rk & Associates, Inc.

Facility: Behr Iron and Metal Rockford Facility

Test Location: Northwest Baghouse Outlet Stack

Source Condition: Normal

Date: 10/6/15

Start Time: 14:40

End Time: 16:52

DRY GAS METER CONDITIONS

ΔH : 1.29 in. H₂O
 Meter Temperature, T_m: 73.8 °F
 $\sqrt{\Delta P}$: 0.731 in. H₂O
 Stack Temperature, T_s: 89.9 °F
 Meter Volume, V_m: 85.452 ft³
 Meter Volume, V_{mstd}: 82.329 dscf
 Meter Volume, V_{wstd}: 1.243 wscf
 Isokinetic Variance: 100.9 %I

 Test Length 120.00 in mins.
 Nozzle Diameter 0.230 in inches
 Barometric Pressure 29.40 in Hg
 Calculated Fo: #DIV/0!

STACK CONDITIONS

Static Pressure -2.00 in. H₂O
 Flue Pressure (Ps): 29.25 in. Hg. abs.
 Carbon Dioxide: 0.00 %
 Oxygen: 20.90 %
 Nitrogen: 79.1 %
 Gas Weight dry, M_d: 28.836 lb/lb mole
 Gas Weight wet, M_s: 28.675 lb/lb mole
 Excess Air: --- %
 Gas Velocity, V_s: 42.516 fps
 Volumetric Flow: 15,152 acfm
 Volumetric Flow: 14,013 dscfm
 Volumetric Flow: 14,224 scfm
 Fo Validity: #DIV/0!

MOISTURE DETERMINATION

Initial Impinger Content: 1911.0 ml
 Final Impinger Content: 1924.6 ml
 Impinger Difference: 13.6 ml

 Silica Initial Wt. 841.0 grams
 Silica Final Wt. 853.8 grams
 Silica Difference: 12.8 grams

Total Water Gain: 26.4

Moisture, Bws: 0.015

Supersaturation Value, Bws: 0.048

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	14:40:00	0.55	1.31	74.257	89	70	68	0.742	3.263	43.119
2	14:45:00	0.58	1.38	77.520	90	72	68	0.762	3.690	44.280
3	14:50:00	0.58	1.38	81.210	90	73	68	0.762	3.820	44.280
4	14:55:00	0.60	1.43	85.030	90	75	68	0.775	3.590	45.037
5	15:00:00	0.63	1.50	88.620	90	76	69	0.794	3.970	46.149
6	15:05:00	0.60	1.43	92.590	89	77	69	0.775	3.700	45.037
7	15:10:00	0.58	1.38	96.290	90	77	70	0.762	3.800	44.280
8	15:15:00	0.54	1.29	100.090	90	78	70	0.735	3.440	42.726
9	15:20:00	0.52	1.24	103.530	89	78	71	0.721	3.610	41.927
10	15:25:00	0.49	1.17	107.140	89	78	71	0.700	3.350	40.700
11	15:30:00	0.43	1.03	110.490	89	77	71	0.656	3.200	38.126
12	15:35:00	0.34	0.81	113.690	89	77	71	0.583	3.034	33.902
	15:40:00			116.724						
2-1	15:52:00	0.58	1.38	116.724	88	73	71	0.762	3.426	44.280
2	15:57:00	0.61	1.45	120.150	88	75	71	0.781	4.040	45.411
3	16:02:00	0.67	1.59	124.190	89	77	71	0.819	4.020	47.591
4	16:07:00	0.62	1.48	128.210	90	78	71	0.787	3.830	45.781
5	16:12:00	0.64	1.53	132.040	90	78	72	0.800	3.980	46.514
6	16:17:00	0.61	1.45	136.020	90	79	72	0.781	3.730	45.411
7	16:22:00	0.55	1.33	139.750	91	79	72	0.742	3.670	43.119
8	16:27:00	0.51	1.23	143.420	92	79	72	0.714	3.420	41.522
9	16:32:00	0.49	1.18	146.840	91	79	73	0.700	3.550	40.700
10	16:37:00	0.47	1.14	150.390	91	79	73	0.686	3.360	39.860
11	16:42:00	0.41	0.99	153.750	91	79	73	0.640	3.160	37.229
12	16:47:00	0.33	0.78	156.910	92	79	73	0.574	2.799	33.400
	16:52:00			159.709						

Total	2:00:00			85.452		76.8	70.8		85.452	
Average			1.29		89.9	73.8		0.731		
Min			0.78		88.0	68.0		0.574		
Max			1.59		92.0	79.0		0.819		

Run 3-Method 5/29

Client: **Rk & Associates, Inc.**
 Facility: **Behr Iron and Metal Rockford Facility**
 Test Location: **Northwest Baghouse Outlet Stack**
 Source Condition: **Normal**

Date: **10/6/15**
 Start Time: **17:35**
 End Time: **19:51**

DRY GAS METER CONDITIONS

ΔH : 1.43 in. H₂O
 Meter Temperature, T_m: 74.0 °F
 $\text{Sqrt } \Delta P$: 0.769 in. H₂O
 Stack Temperature, T_s: 92.2 °F
 Meter Volume, V_m: 90.586 ft³
 Meter Volume, V_{mstd}: 87.274 dscf
 Meter Volume, V_{wstd}: 1.484 wscf
 Isokinetic Variance: 102.0 %I
 Test Length 120.00 in mins.
 Nozzle Diameter 0.230 in inches
 Barometric Pressure 29.40 in Hg
 Calculated Fo: #DIV/0!

STACK CONDITIONS

Static Pressure -2.00 in. H₂O
 Flue Pressure (Ps): 29.25 in. Hg. abs.
 Carbon Dioxide: 0.00 %
 Oxygen: 20.90 %
 Nitrogen: 79.1 %
 Gas Weight dry, M_d: 28.836 lb/lb mole
 Gas Weight wet, M_s: 28.655 lb/lb mole
 Excess Air: %
 Gas Velocity, V_s: 44.844 fps
 Volumetric Flow: 15,981 acfm
 Volumetric Flow: 14,690 dscfm
 Volumetric Flow: 14,940 scfm
 Fo Validity: #DIV/0!

MOISTURE DETERMINATION

Initial Impinger Content: 2094.0 ml
 Final Impinger Content: 2110.9 ml
 Impinger Difference: 16.9 ml
 Silica Initial Wt. 809.7 grams
 Silica Final Wt. 824.3 grams
 Silica Difference: 14.6 grams

Total Water Gain: 31.5 Moisture, Bws: 0.017 Supersaturation Value, Bws: 0.052

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	17:35:00	0.64	1.55	60.017	94	70	70	0.800	3.503	46.629
2	17:40:00	0.62	1.49	63.520	93	72	70	0.787	3.940	45.894
3	17:45:00	0.69	1.67	67.460	92	76	70	0.831	4.140	48.416
4	17:50:00	0.67	1.62	71.600	92	76	70	0.819	4.000	47.709
5	17:55:00	0.66	1.59	75.600	92	77	71	0.812	4.250	47.352
6	18:00:00	0.66	1.59	79.850	92	78	71	0.812	3.840	47.352
7	18:05:00	0.65	1.57	83.690	91	78	71	0.806	3.920	46.991
8	18:10:00	0.56	1.35	87.610	91	77	71	0.748	3.740	43.617
9	18:15:00	0.54	1.30	91.350	91	79	72	0.735	3.750	42.831
10	18:20:00	0.53	1.28	95.100	91	79	72	0.728	3.560	42.433
11	18:25:00	0.50	1.21	98.660	90	79	72	0.707	3.530	41.214
12	18:30:00	0.48	1.16	102.190	90	79	72	0.693	3.395	40.382
	18:35:00			105.585						
2-1	18:51:00	0.65	1.57	105.585	89	76	71	0.806	4.035	46.991
2	18:56:00	0.64	1.55	109.620	89	77	71	0.800	3.880	46.629
3	19:01:00	0.66	1.59	113.500	89	77	71	0.812	4.100	47.352
4	19:06:00	0.66	1.59	117.600	89	79	71	0.812	4.050	47.352
5	19:11:00	0.63	1.52	121.650	91	79	72	0.794	3.760	46.263
6	19:16:00	0.60	1.45	125.410	93	78	71	0.775	3.840	45.148
7	19:21:00	0.58	1.40	129.250	94	77	71	0.762	3.730	44.389
8	19:26:00	0.55	1.33	132.980	94	77	71	0.742	3.740	43.226
9	19:31:00	0.54	1.30	136.720	95	77	71	0.735	3.960	42.831
10	19:36:00	0.54	1.30	140.680	97	77	71	0.735	3.240	42.831
11	19:41:00	0.51	1.23	143.920	97	76	71	0.714	3.670	41.624
12	19:46:00	0.49	1.18	147.590	97	76	70	0.700	3.013	40.800
	19:51:00			150.603						

Total	2:00:00			90.586		76.9	71.0		90.586	
Average			1.43		92.2	74.0		0.769		
Min			1.16		89.0	70.0		0.693		
Max			1.67		97.0	79.0		0.831		

Behr Iron and Metal
Rockford, IL

Time	CO2 %	O2%	
12:11:00	-0.01	0.01	Cals
12:12:00	-0.01	-0.03	Cals
12:13:00	3.66	4.4	Cals
12:14:00	20.17	21.77	Cals
12:15:00	19.62	21.91	Cals
12:16:00	18.9	22.01	Cals
12:17:00	18.76	22.02	Cals
12:18:00	18.8	22.03	Cals
12:19:00	16.14	20.45	Cals
12:20:00	9.41	12.03	Cals
12:21:00	9.62	12.02	Cals
12:22:00	9.99	12.02	Cals
12:23:00	9.98	12.01	Cals
12:24:00	8.05	13.64	Cals
12:42:00	0.11	20.77	Ambient air in box truck
12:43:00	0.1	20.77	Ambient air in box truck
12:44:00	0.1	20.77	Ambient air in box truck
12:45:00	0.1	20.78	Ambient air in box truck
12:47:00	0.15	20.75 Test 1	NW Baghouse Cooler Inlet
12:48:00	0.14	20.75 Test 1	NW Baghouse Cooler Inlet
12:49:00	0.14	20.75 Test 1	NW Baghouse Cooler Inlet
12:50:00	0.13	20.75 Test 1	NW Baghouse Cooler Inlet
12:52:00	0.09	20.76 Test 1	NW Baghouse Stack
12:53:00	0.09	20.76 Test 1	NW Baghouse Stack
12:54:00	0.08	20.76 Test 1	NW Baghouse Stack
12:55:00	0.08	20.76 Test 1	NW Baghouse Stack
12:57:00	0.07	20.79 Test 1	NW Baghouse Sand Seperator
12:58:00	0.07	20.79 Test 1	NW Baghouse Sand Seperator
12:59:00	0.07	20.79 Test 1	NW Baghouse Sand Seperator
13:00:00	0.07	20.79 Test 1	NW Baghouse Sand Seperator
13:03:00	-0.01	-0.06	Cals
13:04:00	-0.01	-0.06	Cals
13:05:00	9.3	11.13	Cals
13:06:00	9.72	11.95	Cals
13:07:00	9.85	11.95	Cals
13:08:00	9.9	11.97	Cals

Appendix F - Field Data Sheets

Isokinetic Sampling Cover Sheet

Test Engineer: MLIP
Test Technician: NCC

Plant Information

Run Number: #1 Date: 10/16/15 Project Number: MIS4005
Test Location: Sand Separator Client Name: Behc Plant Name: Behc
Duct Shape: Circular or Rectangular Length: — Width: — or Diameter: 1.333'
Flue Area: 1.396 Upstream Diameters: 2.5 Downstream Diameters: 72
Port Type: Hole in Duct Port Length: 0" Port Diameter: 6"
Test Method: 5/29 Source Condition: Normal

Meter and Probe Data

Meter ID: CM33 Meter Y Value: 1.003 ΔH Value: 1.248
Pitot ID: 256 Pitot Coefficient: .84 Train Type: Anderson
Nozzle Kit ID: Glass #7 Nozzle Diameter: .310 Filter Number/Weight: 8959/1.4753
Probe Length: 3 feet Probe Liner: Glass Thimble Number/Weight: —
Pre-Test Nozzle Leak Check: .002 @ 10 "Hg Post-Test Nozzle Leak Check: .002 @ 11 "Hg
Pre-Test Pitot Leak Check: .000 @ 4 "H₂O Post-Test Pitot Leak Check: .000 @ 4 "H₂O

Traverse Data

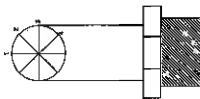
Ports Sampled: 24 Points/Port: 12/2 Min/Point: 5
Total Test Time: 120 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.4 Static Pressure: -2.0 Determined by: Method 3 or Method 3A
CO₂ %: 1 O₂ %: 1 / Avg. 20.9 Servomex Serial #: 014401/3830
Imp and/or silica balance Model and S/N: S10-37 Imp. Volume or Weight: 2005.7 Imp. Volume or Weight Gain: 0.20
Initial Imp. Volume or Weight: 2005.7 Final Imp. Volume or Weight: 2005.7 Silica Weight Gain: 24.5
Initial Silica Weight: 833.3 Final Silica Weight: 857.8

Comments:

Post-Test Nozzle Verification:



1) ☒ 2) ☒ 3) ☒ 4) ☒

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 10/6/15 Test Number: 1
 Client: Behr Test Location: Sand Separator Operator: MLIP Test Tech: MCC
 Plant: Behr Oakland Test Method: 29 Page Number: 1 of 1

Port-Point #.	Time	(ΔP)	* 9.446	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, " Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	11:40	.20	1.88	152.30	.44	.761	3.806	19.036	64	61	62	0	250	248	60
2	11:45	.22	2.074	19.080	.46	.811	4.055	23.091	68	62	63	0	245	245	61
3	11:50	.20	1.88	23.200	.44	.761	3.806	26.897	63	63	63	2	245	246	62
4	11:55	.20	1.88	26.990	.44	.761	3.806	30.703	63	63	63	3	246	249	62
5	12:00	.18	1.70	30.820	.42	.733	3.669	34.372	69	63	63	4	245	251	63
6	12:05	.18	1.70	34.310	.42	.733	3.669	38.041	72	65	63	5	244	254	64
7	12:10	.25	2.26	38.140	.50	.865	4.325	42.366	79	64	63	5	240	249	64
8	12:15	.28	2.64	42.450	.52	.899	4.498	46.864	82	65	64	5	245	250	64
9	12:20	.24	2.26	46.980	.48	.830	4.152	51.013	82	65	64	6	249	252	65
10	12:25	.28	2.64	51.210	.52	.915	4.577	55.590	80	66	64	6	244	252	66
11	12:30	.45	4.25	55.610	.67	1.16	5.802	61.392	80	67	64	7	241	246	66
12	12:35	.45	4.25	61.280	.67	1.16	5.802	67.194	80	66	64	7	243	246	65
	12:40			67.233				67.194							
2-1	12:52	.16	1.51	67.233	.40	.692	3.460	70.693	70	64	65	4	253	250	62
2	12:57	.18	1.70	70.730	.42	.733	3.669	74.362	64	65	65	4	247	250	63
3	13:02	.18	1.70	74.110	.42	.733	3.669	78.031	64	66	64	4	250	250	62
4	13:07	.15	1.41	78.180	.38	.670	3.350	81.381	60	65	64	5	253	254	63
5	13:12	.12	1.13	81.520	.34	.599	2.996	84.377	57	67	62	5	257	250	64
6	13:17	.15	1.41	84.490	.38	.670	3.350	87.727	58	67	63	5	251	252	64
7	13:22	.20	1.88	87.940	.44	.761	3.806	91.533	59	67	65	5	252	252	62
8	13:27	.30	2.83	91.810	.54	.947	4.737	96.270	59	67	65	4	254	251	63
9	13:32	.24	2.26	96.330	.48	.847	4.237	100.507	59	67	65	4	248	253	63
10	13:37	.30	2.83	100.490	.54	.947	4.737	105.241	60	68	65	4	249	250	64
11	13:42	.16	1.51	105.220	.42	.733	3.669	108.910	60	68	65	6	249	250	65
12	13:47	.20	1.88	109.330	.44	.761	3.806	112.716	60	69	66	6	250	250	65
	13:52			112.912											

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & Metal

UNIT NO: NW Baghouse

LOCATION: Sand separator

DATE: 10/6/15

TEST NO: 1 (A)

METHOD: 5/29

WEIGHED/MEASURED BY: M&P

BALANCE ID: 510-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	707.4	726.5		
IMPINGER 2	679.2	665.6		
IMPINGER 3	619.3	613.6		
IMPINGER 4	857.8	833.3		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2005.9 2005.7 0.2
 FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 24.5
 FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: MLP
Test Technician: MLC

Plant Information

Run Number: 2 Date: 12/6/15 Project Number: M154025
Test Location: Send Separator Client Name: Behr Plant Name: Behr Backford
Duct Shape: Circular or Rectangular Length: --- Width: --- or Diameter: 1.333
Flue Area: 1.396 Upstream Diameters: 2.5 Downstream Diameters: >2
Port Type: Hole in Duct Port Length: 0" Port Diameter: 6"
Test Method: 5/29 Source Condition: Normal

Meter and Probe Data

Meter ID: CM33 Meter Y Value: 1.003 ΔH Value: 1.748
Pitot ID: 256 Pitot Coefficient: 1.840 Train Type: Anderson
Nozzle Kit ID: 66557 Nozzle Diameter: 3.10 Filter Number/Weight: 8753/.4413
Probe Length: 3 feet Probe Liner: 6633 Thimble Number/Weight: ---
Pre-Test Nozzle Leak Check: .002 @ 12 "Hg Post-Test Nozzle Leak Check: .002 @ 12 "Hg
Pre-Test Pitot Leak Check: .000 @ 4 "H₂O Post-Test Pitot Leak Check: .000 @ 4 "H₂O

Traverse Data

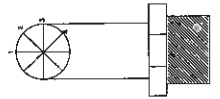
Ports Sampled: 2 Points/Port: 12 Min/Point: 5
Total Test Time: 120 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.40 Static Pressure: -2.0 Determined by: Method 3 or Method 3A
CO₂ %: 1 / Avg. 0 O₂ %: 5.0-37 / Avg. 20.9 Servomex Serial #: 014407/5935
Imp and/or silica balance Model and S/N: --- Imp. Volume or Weight: 2109 Imp. Volume or Weight Gain: 6.7
Initial Imp. Volume or Weight: 2102.3 Final Imp. Volume or Weight: 877.7 Silica Weight Gain: 18.6
Initial Silica Weight: 859.1

Comments:

Post-Test Nozzle Verification:



1) ☒ 2) ☒ 3) ☒ 4) ☒

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 10/6/15 Test Number: 2
 Client: Behr Test Location: Sand Spreader Operator: MLP Test Tech: NCC
 Plant: Behr Bedford Test Method: 29 Page Number: 1 of 1

1.761

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	14:40	.18	1.72	114.905	.42	.739	3.698	222	67	69	71	4	254	248	62
2	14:45	.16	1.52	118.700	.40	.704	3.522	118.603	68	69	71	4	250	250	62
3	14:50	.15	1.43	122.320	.38	.682	3.410	122.125	64	70	72	4	244	246	64
4	14:55	.15	1.43	125.660	.38	.682	3.410	125.535	64	70	72	4	240	245	63
5	15:00	.10	0.95	128.940	.31	.556	2.784	128.945	65	70	71	5	245	247	63
6	15:05	.12	1.14	131.970	.34	.610	3.050	131.729	65	71	70	4	250	251	62
7	15:10	.22	2.10	134.820	.46	.825	4.129	134.779	66	71	70	4	250	250	62
8	15:15	.35	3.34	139.160	.59	1.04	5.209	138.908	66	71	70	4	247	251	61
9	15:20	.35	3.34	144.220	.59	1.04	5.209	144.117	66	72	71	4	248	251	61
10	15:25	.33	3.15	149.450	.57	1.01	5.058	149.326	67	72	71	6	247	250	60
11	15:30	.45	4.30	154.510	.67	1.18	5.906	154.384	67	72	70	7	246	251	60
12	15:35	.43	4.10	160.390	.65	1.15	5.773	160.290	67	73	70	8	242	244	60
	15:40			166.180				166.063							
2-1	15:52	.15	1.43	166.180	.38	.682	3.410	222	73	71	73	3	250	248	61
2	15:57	.20	1.91	169.710	.44	.787	3.937	169.590	73	72	72	7	248	249	61
3	16:02	.20	1.91	173.720	.44	.787	3.937	173.527	71	73	72	7	248	250	62
4	16:07	.18	1.72	177.520	.42	.739	3.698	177.464	70	73	72	7	245	251	63
5	16:12	.18	1.91	181.350	.44	.787	3.937	181.162	68	73	72	5	253	250	63
6	16:17	.14	1.33	185.410	.37	.658	3.294	185.009	68	73	72	4	254	251	63
7	16:22	.15	1.43	188.390	.38	.682	3.410	188.393	65	74	72	4	250	250	63
8	16:27	.16	1.52	191.710	.40	.704	3.522	191.915	63	74	72	5	251	250	63
9	16:32	.18	1.72	195.780	.44	.787	3.937	195.437	63	74	72	6	244	252	62
10	16:37	.49	4.68	199.550	.70	1.23	6.163	199.374	63	74	72	7	245	244	62
11	16:42	.51	4.87	205.810	.71	1.25	6.288	205.537	64	74	72	8	247	244	62
12	16:47	.50	4.71	211.950	.70	1.24	6.226	211.825	64	73	72	8	250	250	62
	16:52			219.051				218.051							

IMPINGER WEIGHT SHEET

PLANT: Behr Iron + Metal

UNIT NO: NW Baghouse

LOCATION: Sand Separator

DATE: 10/6/15

TEST NO: 2 (A)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: 510-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	723.7	734.7		
IMPINGER 2	734.1	720.8		
IMPINGER 3	651.2	646.8		
IMPINGER 4	877.7	859.1		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2109.0 2102.3 6.7
 FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 18.6
 FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: MLTP
Test Technician: NCC

Plant Information	
Run Number: <u>#3</u>	Date: <u>10/6/15</u>
Test Location: <u>Send Separator</u>	Client Name: <u>Behr</u>
Duct Shape: <u>Circular or Rectangular</u>	Length: <u>5.5</u> or Diameter: <u>1.333</u>
Flue Area: <u>1.396</u>	Upstream Diameters: <u>5.5</u>
Port Type: <u>Horizontal Duct</u>	Port Length: <u>0"</u>
Test Method: <u>5/29</u>	Source Condition: <u>Normal</u>
	Downstream Diameters: <u>5.5</u>
	Port Diameter: <u>6"</u>
	Project Number: <u>M154005</u>
	Plant Name: <u>Behr</u>

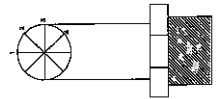
Meter and Probe Data	
Meter ID: <u>CM33</u>	Meter Y Value: <u>1.003</u>
Pitot ID: <u>256</u>	Pitot Coefficient: <u>.84</u>
Nozzle Kit ID: <u>Ref on Loose</u>	Nozzle Diameter: <u>.300</u>
Probe Length: <u>8 feet</u>	Probe Liner: <u>6155</u>
Pre-Test Nozzle Leak Check: <u>.0018</u>	@ <u>12</u> "Hg Post-Test Nozzle Leak Check: <u>.002</u>
Pre-Test Pitot Leak Check: <u>.000</u>	@ <u>4</u> "H ₂ O Post-Test Pitot Leak Check: <u>.000</u>
	Train Type: <u>Anderson</u>
	Filter Number/Weight: <u>—</u>
	Thimble Number/Weight: <u>—</u>
	@ <u>13</u> "Hg
	@ <u>4</u> "H ₂ O
	ΔH Value: <u>1.748</u>

Traverse Data	
Ports Sampled: <u>2</u>	Points/Port: <u>12</u>
Total Points: <u>24</u>	Total Test Time: <u>120</u>
	Min/Point: <u>5</u>
	Sample Plane: <u>Horizontal</u> or Vertical

Stack Parameters	
Barometric Pressure: <u>29.40</u>	Static Pressure: <u>-2.0</u>
CO ₂ %: <u>1</u>	O ₂ %: <u>1</u>
Imp and/or silica balance Model and S/N: <u>S/D-377</u>	Avg. <u>20.9</u>
Initial Imp. Volume or Weight: <u>2016.8</u>	Servomex Serial #: <u>01440013935</u>
Initial Silica Weight: <u>839.6</u>	Imp. Volume or Weight Gain: <u>17.9</u>
	Silica Weight Gain: <u>16.9</u>

Comments:

Post-Test Nozzle Verification:



1) ☒ 2) ☒ 3) ☒ 4) ☒

Isokinetic Sampling Field Data Sheet

Project Number: M154002 Date: 10/6/15 Test Number: 3
 Client: Behr Test Location: Sand Separator Operator: MLP Test Tech: NCC
 Plant: Behr Backford Test Method: 29 Page Number: 1

1,727

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	17:40	.21	1.93	221.074	.45	.77	3.885	224.959	64	70	72	2	250	252	61
2	17:45	.22	2.02	225.110	.46	.79	3.972	224.959	55	70	72	2	245	252	60
3	17:50	.21	1.93	228.790	.45	.77	3.885	228.931	48	72	71	2	246	250	60
4	17:55	.21	1.93	232.920	.45	.77	3.885	232.816	49	73	71	3	246	251	62
5	18:00	.20	1.83	236.900	.44	.75	3.799	236.701	44	73	70	3	251	251	62
6	18:05	.18	1.65	240.770	.42	.73	3.663	240.500	44	73	70	3	250	250	63
7	18:10	.18	1.65	244.420	.42	.73	3.663	244.163	44	74	72	4	251	251	64
8	18:15	.26	2.38	248.000	.50	.88	4.403	247.826	49	74	72	4	254	251	64
9	18:20	.25	2.29	252.460	.50	.86	4.3175	252.229	49	73	71	4	246	250	63
10	18:25	.11	1.01	256.710	.33	.57	2.863	256.546	44	73	71	4	248	250	62
11	18:30	.15	1.37	259.650	.38	.66	3.844	259.409	49	73	71	3	250	250	62
12	18:35	.14	1.28	262.600	.37	.63	3.194	262.603	49	73	70	3	258	251	62
13	18:40			265.880				265.797							
2-1	18:51	.17	1.36	265.980	.41	.70	3.540	269.420	50	69	69	2	243	250	61
2	18:56	.14	1.28	269.500	.37	.63	3.194	269.420	50	69	68	2	243	250	61
3	19:01	.15	1.37	272.710	.38	.66	3.344	272.614	50	70	69	2	250	249	62
4	19:06	.14	1.28	276.020	.37	.63	3.194	275.958	50	70	69	2	254	248	63
5	19:11	.14	1.28	279.410	.37	.63	3.194	279.152	50	70	69	2	256	250	63
6	19:16	.15	1.37	282.350	.38	.66	3.344	282.346	50	70	69	2	255	251	63
7	19:21	.26	2.29	285.860	.50	.99	4.403	285.690	50	70	69	2	255	249	63
8	19:26	.25	2.29	290.320	.50	.86	4.317	290.093	50	69	67	3	247	249	63
9	19:31	.11	1.01	294.750	.33	.57	2.863	294.410	50	69	67	3	250	250	63
10	19:36	.22	2.02	297.440	.46	.79	3.972	297.273	50	69	67	3	250	251	62
11	19:41	.21	1.93	301.420	.45	.77	3.885	301.245	50	69	66	3	244	250	62
12	19:46	.15	1.37	305.260	.38	.66	3.344	305.130	50	69	66	3	247	250	62
13	19:51			308.650				308.474							

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & Metal

UNIT NO: NW Baghouse

LOCATION: Sand Separator

DATE: 10/6/15

TEST NO: 3 (A)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: S10-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	728.7	727.9		
IMPINGER 2	684.3	673.6		
IMPINGER 3	616.7	615.3		
IMPINGER 4	856.5	839.6		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2029.7 2016.8 12.9
FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 16.9
FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: BLS
Test Technician: DK

Plant Information

Run Number: #1 Date: 10/12/2015 Project Number: M154005
Test Location: AN PUGH'S INLET Client Name: Joseph Behr & Sons Inc Plant Name: Joseph Behr & Sons Inc
Duct Shape: Circular or Rectangular Length: 2.75 ft or Diameter: 2.75 ft
Flue Area: 5.940 Upstream Diameters: 7.5 Downstream Diameters: 7.2
Port Type: Nozzle Port Length: 6 Port Diameter: 6
Test Method: M529 Source Condition: Normal

Meter and Probe Data

Meter ID: M126 Meter Y Value: .990 ΔH Value: 1.702
Pitot ID: 171 Pitot Coefficient: 1.0 Train Type: ANDERSON
Nozzle Kit ID: #1 Nozzle Diameter: .211 / 2412 (32) Filter Number/Weight: 8750 / 0.4418
Probe Length: 8.5 ft Probe Liner: 50655 Thimble Number/Weight: 0 / 15
Pre-Test Nozzle Leak Check: 0 @ 10 "Hg Post-Test Nozzle Leak Check: 0 @ 15 "Hg
Pre-Test Pitot Leak Check: 0 @ 3.0 "H₂O Post-Test Pitot Leak Check: 0 @ 3.5 "H₂O

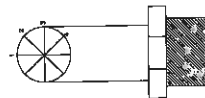
Traverse Data

Ports Sampled: 2 Points/Port: 20 Min/Point: 3
Total Points: 40 Total Test Time: 11.0 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.39 Static Pressure: 0.5 Determined by: Method 3 or Method 3A
CO₂ %: 1 O₂ %: 1 / Avg. 20.9 Servomex Serial #: 014401/3935
Imp and/or silica balance Model and S/N: 810-37 Final Imp. Volume or Weight: 1956.24mp Volume or Weight Gain: 1.2
Initial Imp. Volume or Weight: 1955 Final Silica Weight: 849.8 Silica Weight Gain: 2.18
Initial Silica Weight: 828

Comments: Changed Nozzle from .211 to .242 During Port Change Post-Test Nozzle Verification: 1) ✓ 2) ✓ 3) ✓ 4) ✓



Isokinetic Sampling Field Data Sheet

Project Number: M15405

Date: 10/6/2015

Test Number: #1

Client: Wright & Sons Inc

Test Location: NW Baghouse INLET

Operator: BKS

Test Tech: DKE

Plant: 1129

Test Method: 1129

Page Number: 2

Port-Point #	Time	(AP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, " Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	11:40	1.1	2.2	32.518	1.049		2.516	35.034	90	60	60	5	250	258	62
2	11:43	1.5	3.0	35.040	1.235		2.964	35.034	91	65	65	6	246	257	62
3	11:46	1.6	3.2	38.000	1.265		3.667	37.998	89	65	65	6	247	257	62
4	11:49	.94	1.8	41.075	0.954		2.311	41.065	90	68	65	6	245	258	62
5	11:52	.88	1.8	43.385	.988		2.252	43.326	100	65	65	7	246	252	64
6	11:55	.75	1.5	45.630	.866		2.066	45.627	107	65	65	7	247	250	64
7	11:58	.72	1.4	47.700	.849		2.030	47.633	107	67	66	7	252	256	62
8	12:01	.52	1.0	49.740	.721		1.724	45.724	109	68	66	7	251	261	62
9	12:04	.38	.75	51.400	.616		1.470	51.447	112	68	66	7	250	261	62
10	12:07	.26	.53	52.925	.510		1.234	51.917	95	68	66	7	250	260	64
11	12:10	.28	.57	54.155	.529		1.284	54.157	93	69	66	6	247	258	64
12	12:13	.36	.61	55.400	.548		1.329	55.436	93	69	66	4	250	250	64
13	12:16	.29	.60	56.770	.539		1.309	56.765	91	69	66	4	250	257	64
14	12:19	.30	.61	58.088	.548		1.333	58.074	90	69	66	4	263	260	64
15	12:22	.27	.56	59.415	.520		1.265	59.407	90	69	66	4	264	261	64
16	12:25	.26	.53	60.681	.516		1.241	60.672	90	69	66	4	265	261	64
17	12:28	.25	.51	61.925	.500		1.217	61.913	90	69	66	4	260	260	65
18	12:31	.18	.37	63.135	.424		1.033	63.130	90	69	66	4	261	260	65
19	12:34	.20	.41	64.165	.447		1.095	64.163	83	69	66	2	260	261	65
20	12:37	.24	.50	65.260	.490		1.208	65.258	74	67	66	3	264	260	65
2-1	12:40			106.470				106.466							
2	12:52	.72	2.5	66.470	.849		2.697	66.466	96	67	66	8	270	260	64
3	12:55	.88	3.1	69.190	.923		2.981	69.167	96	67	66	9	261	261	64
4	12:58	1.0	3.5	72.150	1.020		3.170	72.148	105	68	66	10	260	259	65
5	13:01	1.1	3.8	75.325	1.049		3.304	75.318	107	68	66	11	260	255	66
6	13:04	1.1	3.8	78.033	1.049		3.768	78.020	109	68	66	10	257	256	67
7	13:07	.94	3.2	81.920	.970		3.046	81.920	111	69	66	10	243	260	62
7	13:10	.71	2.5	84.972	.843		2.688	84.966	94	68	66	10	250	251	62

901770140

Isokinetic Sampling Field Data Sheet

Project Number:

Client:

Plant:

5006516

Robt & Sons

2014/12/13

Date:

Test location:

Test Method:

10/20/55

2025-11-11

351

Test Number:

Operator:

Page Number:

年

Test Tech: All

1

[illegible]

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & Metal

UNIT NO: NW Baghouse

LOCATION: Gas Cooler Inlet

DATE: 10/6/15

TEST NO: 1 (C)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: S10-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	701.1	729.5		
IMPINGER 2	633.2	612.8		
IMPINGER 3	621.9	612.7		
IMPINGER 4	849.8	828.0		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 1956.2 1955.0 1.2
 FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 21.8
 FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: Bea
 Test Technician: Wick

Plant Information

Run Number: #2 Date: 10/6/2015 Project Number: M154501
 Test Location: code / NW Bypass. 1000 Client Name: Behr & Sons Inc Plant Name: Behr & Sons Inc
 Duct Shape: Circular or Rectangular Length: Width: 2.75 or Diameter: 2.75
 Flue Area: 5.440 Upstream Diameters: 7.5 Downstream Diameters: 2.2
 Port Type: Nozzle Port Length: 6" Port Diameter: 6"
 Test Method: M129 Source Condition: Normal

Meter and Probe Data

Meter ID: M129 Meter Y Value: 350 ΔH Value: 1702
 Pitot ID: 171 Pitot Coefficient: .84 Train Type: Air Meter Son
 Nozzle Kit ID: # Testlon 7 Nozzle Diameter: 2.42 Filter Number/Weight: 4757 / 4436
 Probe Length: 5.5 Probe Liner: 6.655 Thimble Number/Weight: ---
 Pre-Test Nozzle Leak Check: 0 @ 10 "Hg Post-Test Nozzle Leak Check: 0 @ 15 "Hg
 Pre-Test Pitot Leak Check: ✓ 0.410 "H₂O Post-Test Pitot Leak Check: ✓ 0.24.0 "H₂O

Traverse Data

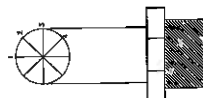
Ports Sampled: 2 Points/Port: 20 Min/Point: 3
 Total Points: 40 Total Test Time: 120 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.35 Static Pressure: -5 / Avg. 20.9 Determined by: Method 3 or Method 3A
 CO₂ %: 1 O₂ %: 1 / Avg. 20.9 Servomex Serial #: 0244013935
 Imp and/or silica balance Model and S/N: 90-57 Final Imp. Volume or Weight: 277.5 Volume or Weight Gain: 8.5
 Initial Imp. Volume or Weight: 271.5 Final Silica Weight: 838.3 Silica Weight Gain: 8.5
 Initial Silica Weight: 829.8

Comments:

Post-Test Nozzle Verification:



1) ✓ 2) ✓ 3) ✓ 4) ✓

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 6/16/2015 Test Number: #2
 Client: Baker Hughes Services Test Location: Coke / Air Package Int Operator: BKS Test Tech: WJW
 Plant: Coke Test Method: 1175 Page Number: 2 of 2

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, " Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	14:40	1.1	3.9	11.928	1.041		3.349	11.928	96	61	61	6	236	257	61
2	14:43	.85	3.0	15.280	.922		2.950	15.277	96	72	69	6	252	250	61
3	14:46	.81	2.9	18.230	.900		2.890	18.227	95	73	70	6	248	262	62
4	14:49	1.02	2.2	21.120	.787		2.529	21.117	96	74	70	6	255	257	62
5	14:52	1.0	3.5	25.650	1.00		3.223	23.645	92	74	70	6	248	255	62
6	14:55	.98	2.5	24.875	.990		3.153	24.868	92	74	71	6	252	250	62
7	14:58	.71	1.4	30.970	.640		2.056	30.002	97	74	71	7	251	252	62
8	15:01	.77	2.8	32.127	.877		2.826	32.113	93	73	71	6	252	250	62
9	15:04	.74	2.6	34.955	.860		2.770	34.943	93	73	71	6	250	258	62
10	15:07	.62	2.2	37.725	.787		2.535	37.713	93	73	71	6	254	263	62
11	15:10	.34	1.2	40.255	.583		1.976	40.245	94	73	71	5	250	252	62
12	15:13	.32	1.1	42.130	.566		1.800	42.125	100	73	71	4	252	251	64
13	15:16	.33	1.2	43.944	.574		1.838	43.535	100	73	71	4	250	257	63
14	15:19	.35	1.2	45.777	.572		1.912	45.773	91	75	71	4	256	260	64
15	15:22	.30	1.2	47.690	.548		1.765	47.685	94	75	71	4	250	261	61
16	15:25	.26	.92	49.467	.510		1.638	49.450	98	75	71	4	251	260	65
17	15:28	.22	.77	51.090	.469		1.506	51.088	100	76	72	4	260	260	66
18	15:31	.20	.70	52.606	.447		1.434	52.591	102	76	70	4	263	258	67
19	15:33	.21	.75	54.040	.458		1.438	54.028	90	77	73	3	254	255	67
20	15:37	.20	.70	55.533	.447		1.460	55.514	85	77	74	3	251	255	67
	15:40	.23	.84	56.982	.480		1.573	56.974	80	77	74	3	250	260	67
2-1	15:52	1.1	3.9	56.582	1.079		2.567	56.570	87	73	73	7	251	261	65
2	15:55	1.0	3.10	61.488	1.000		3.259	61.480	84	80	73	7	250	255	65
3	15:58	.77	3.5	64.710	.988		3.210	64.745	90	82	73	7	252	260	65
4	16:01	.92	3.3	67.965	.959		3.179	67.915	90	81	74	7	250	252	67
5	16:04	.85	3.0	71.090	.922		3.002	71.034	93	82	74	7	251	258	67
6	16:07	.74	2.7	74.098	.860		2.806	74.086	93	83	75	8	250	260	66
7	16:10	.64	2.3	76.500	.800		2.610	76.453	97	83	75	8	253	257	66

Isokinetic Sampling Field Data Sheet

Project Number:

MS405

Date:

11/10/2015

Test Number:

Client:

Behr + Sons Inc

Test Location:

collected from the bottom

Operator:

Plant:

Rockford

Test Method:

4125

Page Number:

Test Tech: DL

_____ of 2

[illegible]

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & METAL

UNIT NO: NW Baghouse

LOCATION: Gas Cooler Inlet

DATE: 10/6/15

TEST NO: 2 (C)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: 510-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	696.6	709.1		
IMPINGER 2	765.6	751.4		
IMPINGER 3	715.4	711.0		
IMPINGER 4	838.3	826.0		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2177.6 2171.5 6.1
 FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 18.3
 FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: BRS
Test Technician: Dik

Plant Information

Run Number: #3 Date: 10/16/2015 Project Number: M154005
Test Location: Center / NW Bayside IN Client Name: Behrsons Plant Name: Rockford
Duct Shape: Circular or Rectangular Length: 2.75 or Diameter: 2.75
Flue Area: 5.940 Upstream Diameters: > .5 Downstream Diameters: > 2
Port Type: Single Port Length: 6" Port Diameter: 6"
Test Method: M25 Source Condition: Normal

Meter and Probe Data

Meter ID: CM26 Meter Y Value: .990 ΔH Value: 1.702
Pitot ID: 178 Pitot Coefficient: .84 Train Type: Anderson
Nozzle Kit ID: #747.0.1 Nozzle Diameter: .242 Filter Number/Weight: 8759 / .4496
Probe Length: 0.55 Probe Liner: 655 Thimble Number/Weight: —
Pre-Test Nozzle Leak Check: 0 @ 10 "Hg Post-Test Nozzle Leak Check: 0 @ 10 "Hg
Pre-Test Pitot Leak Check: ✓ 0.40 "H₂O Post-Test Pitot Leak Check: ✓ 0.50 "H₂O

Traverse Data

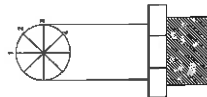
Ports Sampled: 2 Points/Port: 20 Min/Point: —
Total Points: 40 Total Test Time: 7:00 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.35 Static Pressure: -.5 Determined by: Method 3 or Method 3A
CO₂ %: — O₂ %: — / Avg. 0 / Avg. 20.9 Servomex Serial #: 044201/3535
Imp and/or silica balance Model and S/N: S10-337 Imp. Volume or Weight: 19547 Imp. Volume or Weight Gain: 11.3
Initial Imp. Volume or Weight: 9429 Final Imp. Volume or Weight: 844.5 Silica Weight Gain: 21.3
Initial Silica Weight: 823.2

Comments:

Post-Test Nozzle Verification:



1) ✓ 2) ✓ 3) ✓ 4) ✓

Isokinetic Sampling Field Data Sheet

Project Number: M15405 Date: 10/6/15 Test Number: 113
 Client: Behr & Sons Test Location: NW Bayshore / N100 Operator: BJC Test Tech: Alic
 Plant: Rackford Test Method: M2 S Page Number: 1 of 2

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, " Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	1735	1.2	4.2	08.487	1.055		3.536	4.111	105	79	79	6	250	254	52
2	1738	1.3	4.6	12.055	1.140		3.703	12.063	99	80	79	6	251	250	53
3	1741	1.1	3.9	15.735	1.049		3.406	15.726	98	80	78	7	253	253	53
4	1744	.9	3.1	19.145	.949		3.078	19.132	100	81	78	6	250	251	53
5	1747	.86	3.1	22.230	.927		3.012	22.210	99	81	78	6	252	260	55
6	1750	.70	8.5	25.240	.837		2.717	25.222	99	81	78	5	250	260	55
7	1753	.55	2.0	27.945	.742		2.406	27.939	98	80	77	5	248	253	56
8	1756	.35	1.2	30.335	.552		1.920	30.346	98	80	77	5	250	250	57
9	1759	.33	1.2	32.275	.574		1.859	32.265	101	81	76	5	250	249	57
10	1802	.23	.92	32.160	.780		1.566	32.124	98	81	74	5	252	253	58
11	1805	.20	1.1	35.685	.548		1.777	35.680	97	80	76	4	250	248	57
12	1808	.32	1.1	37.480	.566		1.835	37.457	97	80	76	4	257	250	58
13	1811	.38	1.3	39.300	.616		1.943	39.253	98	78	75	4	250	251	59
14	1814	.37	1.3	41.295	.608		1.966	41.286	98	78	75	4	248	253	57
15	1817	.34	1.2	43.265	.583		1.896	43.252	95	77	74	4	250	257	57
16	1820	.26	1.3	45.146	.600		1.939	45.138	96	77	74	3	250	257	57
17	1823	.30	1.1	47.085	.548		1.770	47.078	96	77	74	3	257	254	57
18	1826	.20	1.1	48.875	.548		1.770	48.848	98	77	74	3	250	250	57
19	1829	.25	1.0	50.637	.509		1.707	50.616	98	77	74	4	251	253	57
20	1832	.25	.84	52.340	.500		1.618	52.325	98	77	74	4	252	254	57
21	1835			53.950				53.936							
2-1	1851	.88	2.1	53.950	.938		3.007	4.111	96	71	71	4	265	260	57
2	1854	.89	3.1	56.965	.943		3.036	56.957	96	73	71	4	265	259	50
3	1857	1.1	3.40	59.990	1.049		3.387	59.986	92	75	71	5	266	258	50
4	1900	1.1	3.40	63.385	1.045		3.387	63.373	92	75	71	5	260	260	50
5	1903	1.0	3.5	66.765	1.000		3.220	66.759	96	76	71	5	265	250	51
6	1906	1.0	3.5	69.992	1.000		3.220	69.980	96	76	71	5	257	253	51
7	1909	.98	3.5	73.215	.990		3.197	73.203	93	76	71	5	250	248	51

Isokinetic Sampling Field Data Sheet

Project Number: M154005
 Client: Bhr + Sons
 Plant: PACKFORD
 Date: 10/10/15
 Test Location: New Baltimore INLET
 Test Method: PACKFORD
 Test Number: 275
 Operator: SLC Test Tech: Dickel
 Page Number: 2 of 2

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, " Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
8	1912	.94	3.3	76.415	.970		3.134	76.410	93	77	71	6	250	257	51
9	1915	.80	2.8	79.835	.854		3.872	79.532	100	72	71	6	280	280	50
10	1918	.68	2.4	82.415	.825		2.645	82.406	100	72	71	6	257	250	50
11	1921	.40	1.4	85.060	.632		2.010	85.051	112	77	71	6	250	250	50
12	1924	.35	1.2	87.075	.592		1.877	87.064	114	77	71	7	257	252	53
13	1927	.35	1.2	88.945	.592		1.877	88.941	114	77	71	7	250	280	53
14	1930	.34	1.2	90.830	.582		1.848	90.818	115	77	71	2	257	269	54
15	1933	.29	1.0	92.680	.539		1.708	92.606	114	77	71	2	257	253	54
16	1936	.34	1.2	94.380	.583		1.848	94.375	110	77	71	2	257	253	54
17	1939	.33	1.1	96.240	.574		1.811	96.231	115	76	71	2	257	254	54
18	1942	.30	1.1	98.050	.566		1.786	98.042	116	75	71	2	255	250	54
19	1945	.30	1.0	99.820	.548		1.737	99.828	111	75	71	2	260	255	55
20	1948	.32	1.1	101.567	.566		1.793	101.566	112	75	71	2	260	253	55
	1951			163.365				103.358							

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & Metal
 UNIT NO: NW Baghouse
 LOCATION: Gas Cooler Inlet
 DATE: 10/6/15
 TEST NO: 3 (c)
 METHOD: 5/29
 WEIGHED/MEASURED BY: MEP
 BALANCE ID: 810-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	707.7	715.7		
IMPINGER 2	628.6	613.9		
IMPINGER 3	617.9	613.4		
IMPINGER 4	844.5	823.2		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 1954.2 1942.9 11.3
 FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN
 SILICA 21.3
 FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: MDK
 Test Technician: KOS

B

Plant Information

Run Number: 1 Date: 10-6-15 Project Number: M154005
 Test Location: AN Bldg Outlet Stack Client Name: PK Associates, Inc. Plant Name: Belor Twp. Metal Recycling
 Duct Shape: Circular or Rectangular Length: — Width: — or Diameter: 2.15
 Flue Area: 5.140 Upstream Diameters: >5 Downstream Diameters: >2
 Port Type: Normal Port Length: 8" Port Diameter: 6"
 Test Method: M29 Source Condition: Normal

Meter and Probe Data

Meter ID: Cm15 Meter Y Value: .928 ΔH Value: 1.488
 Pitot ID: 170A Pitot Coefficient: .84 Train Type: Anderson
 Nozzle ID #: G155 #17 Nozzle Diameter: .730 Filter Number/Weight: 8752 / 0.4423
 Probe Length: 4' Probe Liner: G155 Thimble Number/Weight: —
 Pre-Test Nozzle Leak Check: 0.00 @ 15" "Hg Post-Test Nozzle Leak Check: 0.00 @ 9" "Hg
 Pre-Test Pitot Leak Check: ✓ @ 5" "H₂O Post-Test Pitot Leak Check: ✓ @ 5" "H₂O

Traverse Data

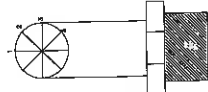
Ports Sampled: 2 Points/Port: 12 Min/Point: 5
 Total Points: 24 Total Test Time: 12.0 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.90 Static Pressure: -2.0 Determined by: Method 3 or Method 3A
 CO₂ %: — O₂ %: — / Avg. 20.9 Servomex Serial #: 0144013935
 Imp and/or silica balance Model and S/N: S/D-37 Imp. Volume or Weight: 2102.1 Imp. Volume or Weight Gain: 9.6
 Initial Imp. Volume or Weight: 2092.5 Final Imp. Volume or Weight: 2102.1 Silica Weight Gain: 18.3
 Initial Silica Weight: 800.2 Final Silica Weight: 818.5

Comments: Imp "B"

Post-Test Nozzle Verification:



1) ✓ 2) ✓ 3) ✓ 4) ✓

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 10-6-15 Test Number: 10-6-15
 Client: RK Associates Inc. Test Location: NW Bingham Ave. + State Operator: M29 Test Tech: KOS
 Plant: Behr Inc. + Methyl Red Test Method: M29 Page Number: 1 of 1

2.384 967

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	1140	.70	1.66	82.541	.836	.799	3.999	86.540	85	61	62	6	253	257	65
2	1145	.70	1.66	86.32	.836	.799	3.999	86.540	86	62	62	6	254	263	66
3	1150	.67	1.59	90.37	.818	.654	3.275	90.539	88	63	62	6	255	259	65
4	1155	.66	1.56	93.54	.812	.776	3.883	93.809	92	67	62	6	255	266	64
5	1200	.62	1.47	97.46	.787	.752	3.763	97.692	93	68	63	6	256	261	64
6	1205	.62	1.47	101.29	.787	.752	3.763	101.455	94	68	63	6	259	261	65
7	1210	.57	1.35	105.08	.754	.727	3.639	105.218	90	69	63	5	261	252	63
8	1215	.53	1.26	108.69	.728	.701	3.509	108.837	87	70	64	5	261	255	62
9	1220	.50	1.19	112.22	.707	.681	3.408	112.366	88	71	64	5	261	257	61
10	1225	.46	1.09	115.62	.678	.652	3.269	115.714	87	70	64	4	260	259	62
11	1230	.46	1.09	119.12	.678	.653	3.269	119.043	87	70	65	4	262	255	62
12	1235	.41	.98	122.39	.640	.619	3.095	122.312	87	70	65	4	260	260	61
	1240			125.607				125.407							
2-1	1252	.69	1.64	125.607	.830	.803	4.016	125.407	89	70	65	6	253	259	51
2	1257	.68	1.62	129.70	.824	.797	3.987	129.423	90	72	65	6	254	260	52
3	1302	.67	1.59	133.65	.818	.791	3.957	133.416	91	73	66	6	254	260	53
4	1307	.64	1.53	137.55	.800	.773	3.868	137.367	92	74	67	6	259	260	54
5	1312	.60	1.43	141.51	.774	.749	3.745	141.235	91	74	67	5	261	261	55
6	1317	.62	1.48	145.21	.787	.761	3.807	144.980	91	74	67	5	261	260	56
7	1322	.56	1.34	148.96	.748	.723	3.618	148.787	89	75	68	5	261	260	56
8	1327	.54	1.29	152.73	.734	.710	3.552	152.465	89	75	68	5	261	260	55
9	1332	.51	1.22	156.19	.714	.690	3.452	155.957	89	75	68	5	260	261	55
10	1337	.49	1.17	159.82	.700	.676	3.384	159.409	90	75	68	4	261	260	55
11	1342	.44	1.05	163.07	.663	.641	3.207	162.793	92	74	68	4	261	260	58
12	1347	.42	1.00	166.62	.648	.626	3.133	166.000	91	73	68	4	261	260	55
	1352			169.241				169.133							

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & Metal

UNIT NO: NW Baghouse

LOCATION: Stack

DATE: 10/6/15

TEST NO: 1 (B)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: 510-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	725.5	735.7		
IMPINGER 2	731.3	716.3		
IMPINGER 3	645.3	640.5		
IMPINGER 4	818.5	800.2		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2102.1 2092.5 9.6
FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 18.3
FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: MDK
Test Technician: KOS

Plant Information

Run Number: 2 Date: 10-6-15 Project Number: M154005
Test Location: New Brunswick Outlet Stack Client Name: RK Associates Inc. Plant Name: Behr Iron + Metal Refractory
Duct Shape: Circular or Rectangular Length: — Width: — or Diameter: 2.75
Flue Area: 5.940 Upstream Diameters: > 5 Downstream Diameters: > 2
Port Type: Nipple Port Length: 8" Port Diameter: 6"
Test Method: M29 Source Condition: Normal

Meter and Probe Data

Meter ID: CM15 Meter Y Value: .988 ΔH Value: 1.488
Pitot ID: 170A Pitot Coefficient: .84 Train Type: Anderson
Nozzle ID #: 6133 #17 Nozzle Diameter: .230 Filter Number/Weight: 8955
Probe Length: 4' Probe Liner: 645 Thimble Number/Weight: —
Pre-Test Nozzle Leak Check: 6.00 @ 12" Hg Post-Test Nozzle Leak Check: 0.00 @ 8" Hg
Pre-Test Pitot Leak Check: ✓ @ 5" H₂O Post-Test Pitot Leak Check: 0.05 @ 5" H₂O

Traverse Data

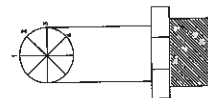
Ports Sampled: 2 Points/Port: 12 Min/Point: 5
Total Points: 24 Total Test Time: 12.0 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.40 Static Pressure: -2.0 Determined by: Method 3 or Method 3A
CO₂ %: — O₂ %: — / Avg. 20.9 Servomex Serial #: 01440813935
Imp and/or silica balance Model and S/N: S10-37 Imp. Volume or Weight: 192.6 Imp. Volume or Weight Gain: 13.6
Initial Imp. Volume or Weight: 841.911 Final Imp. Volume or Weight: 853.8 Silica Weight Gain: 12.8
Initial Silica Weight: 841 Final Silica Weight: 853.8

Comments: Imp "B"

Post-Test Nozzle Verification:



1) ✓ 2) ✓ 3) ✓ 4) ✓

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 10-6-15 Test Number: 2
 Client: 24 Associates Inc. Test Location: NW Baghouse A Hgt Operator: MDK Test Tech: KOS
 Plant: Baker Iron + Metal Refractory Test Method: M 29 Page Number: of

2.416
 98

Port-Point #.	Time	(AP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	1440	55	1.31	74.257	.741	.717	3.585		89	70	68	5	258	258	56
2	1445	58	1.38	77.52	.761	.736	3.682	77.842	90	72	68	5	258	263	53
3	1450	58	1.38	81.21	.761	.736	3.682	81.524	90	73	68	5	259	264	54
4	1455	60	1.42	85.03	.774	.749	3.745	85.206	90	75	68	5	261	260	52
5	1500	63	1.50	88.62	.793	.767	3.837	88.951	89	76	69	6	261	260	50
6	1505	60	1.43	92.59	.774	.749	3.745	92.788	89	77	69	6	260	262	55
7	1510	58	1.38	96.29	.761	.736	3.682	96.533	90	77	70	5	261	261	54
8	1515	54	1.29	100.09	.734	.710	3.552	100.215	90	78	71	5	261	259	53
9	1520	52	1.24	103.53	.721	.697	3.486	103.767	89	78	71	4	260	257	52
10	1525	49	1.17	107.14	.700	.676	3.384	107.253	89	78	71	4	259	257	53
11	1530	43	1.03	110.49	.655	.634	3.170	110.637	89	77	71	3	260	260	53
12	1535	34	.81	113.69	.583	.563	2.819	113.807	89	77	71	3	260	260	53
2-1	1540			116.724				116.626							
2	1552	58	1.38	116.724	.761	.736	3.682	120.308	88	73	71	5	256	258	54
3	1557	61	1.45	120.15	.781	.755	3.776	120.308	88	75	71	6	255	257	48
4	1602	67	1.59	124.19	.818	.791	3.957	124.684	89	77	71	6	260	261	49
5	1607	62	1.48	128.21	.787	.761	3.807	128.041	90	78	71	6	260	260	48
6	1612	64	1.53	132.04	.800	.773	3.868	131.848	90	78	72	6	261	259	49
7	1617	61	1.45	136.02	.781	.755	3.776	135.716	90	79	72	6	260	261	47
8	1622	55	1.33	139.75	.741	.726	3.633	139.492	91	79	72	5	260	260	50
9	1627	51	1.23	143.42	.714	.699	3.499	143.125	92	79	73	5	260	262	48
10	1632	49	1.18	146.84	.700	.686	3.430	146.624	91	79	73	4	260	263	48
11	1637	47	1.14	150.37	.685	.671	3.359	150.054	91	79	73	4	260	258	48
12	1642	41	.99	153.75	.640	.627	3.137	153.413	91	79	73	4	260	261	49
	1647	33	.78	156.91	.574	.562	2.814	156.550	92	79	73	3	260	261	50
	1652			159.709				159.364							

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & Metal

UNIT NO: NW Baghouse

LOCATION: Stack

DATE: 10/6/15

TEST NO: 2 (B)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: 510-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	657.1	654.1		
IMPINGER 2	649.4	640.3		
IMPINGER 3	618.1	616.6		
IMPINGER 4	853.8	841.0		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 1924.6 1911.0 13.6
FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 12.8
FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: MDK
Test Technician: KOS

Plant Information

Run Number: 3 Date: 10-6-15 Project Number: M154005
Test Location: NW Baghouse Outlet Stack Client Name: RV Associates Inc Plant Name: Beth Iron + Metal Refining
Duct Shape: Circular or Rectangular Length: — Width: — or Diameter: 2.75
Flue Area: 5.940 Upstream Diameters: 7.5 Downstream Diameters: 7.2
Port Type: Nipple Port Length: 8" Port Diameter: 6"
Test Method: M29 Source Condition: Normal

Meter and Probe Data

Meter ID: C.M.15 Meter Y Value: .988 ΔH Value: 1.488
Pitot ID: 170 A Pitot Coefficient: .84 Train Type: Anderson
Nozzle ID # 6133 Nozzle Diameter: .230 Filter Number/Weight: 8138
Probe Length: 4' Probe Liner: Glass Thimble Number/Weight: —
Pre-Test Nozzle Leak Check: 0.00 @ 9 "Hg Post-Test Nozzle Leak Check: — @ 12 "Hg
Pre-Test Pitot Leak Check: — @ 5 "H₂O Post-Test Pitot Leak Check: — @ 40 "H₂O

Traverse Data

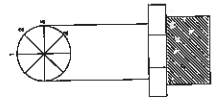
Ports Sampled: 2 Points/Port: 12 Min/Point: 5
Total Test Time: 120 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.4 Static Pressure: -2.0 Determined by: Method 3 or Method 3A
CO₂ %: — O₂ %: — / Avg. — / Avg. 20.9 Servomex Serial #: 01440511833
Imp and/or silica balance Model and S/N: — Imp. Volume or Weight: 2110.9 Imp. Volume or Weight Gain: 6.9
Initial Imp. Volume or Weight: 2094 Final Silica Weight: 824.3 Silica Weight Gain: 14.6
Initial Silica Weight: 809.7

Comments:

Post-Test Nozzle Verification:



1) ✓ 2) ✓ 3) ✓ 4) ✓

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 10-6-15 Test Number: 3
 Client: RK Associates Inc Test Location: NW Baghouse Outlet Stack Operator: MDK Test Tech: KOS
 Plant: Bahr Iron + Metal Refractory Test Method: M 29 Page Number: 1 of 1

✓ 2.416 K.98

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	1735	.64	1.55	60.017	.800	.784	3.920		94	70	70	5	258	259	52
2	1740	.62	1.49	63.52	.787	.771	3.858	63.937	93	72	70	5	258	260	48
3	1745	.69	1.67	67.46	.830	.814	4.070	67.195	92	76	70	5	261	263	52
4	1750	.67	1.62	71.60	.818	.802	4.010	71.865	92	76	70	5	261	262	52
5	1755	.66	1.59	75.60	.812	.795	3.978	75.875	92	77	71	5	258	261	53
6	1800	.66	1.59	79.51	.812	.795	3.978	79.853	92	78	71	5	261	260	54
7	1805	.65	1.57	83.69	.806	.790	3.950	83.831	91	78	71	5	260	258	55
8	1810	.56	1.35	87.61	.748	.733	3.666	87.781	91	77	71	5	261	255	53
9	1815	.54	1.30	91.35	.734	.720	3.600	91.447	91	79	72	5	250	262	50
10	1820	.53	1.28	95.10	.728	.713	3.567	95.047	91	79	72	5	261	263	51
11	1825	.50	1.21	98.66	.707	.692	3.464	98.614	90	79	72	4	260	260	49
12	1830	.48	1.16	102.19	.692	.678	3.394	102.078	90	79	72	4	260	259	49
	1835			105.585				105.472							
2-1	1851	.65	1.57	105.585	.806	.790	3.950		89	76	71	5	257	258	43
2	1856	.64	1.55	109.62	.800	.784	3.920	109.422	89	77	71	5	257	261	44
3	1901	.66	1.59	113.50	.812	.796	3.980	113.342	89	77	71	5	259	260	45
4	1906	.66	1.59	117.60	.812	.796	3.980	117.322	89	79	71	5	261	260	45
5	1911	.63	1.52	121.65	.793	.777	3.889	121.302	91	79	72	5	261	260	46
6	1916	.60	1.45	125.41	.774	.759	3.795	125.191	93	78	71	5	261	259	45
7	1921	.58	1.40	129.25	.761	.746	3.731	128.986	94	77	71	5	259	260	45
8	1926	.55	1.33	132.98	.741	.726	3.633	132.717	94	77	71	5	261	261	45
9	1931	.54	1.30	136.72	.734	.720	3.600	136.356	95	77	71	5	261	261	44
10	1936	.54	1.30	140.68	.734	.720	3.600	139.956	97	77	71	5	260	262	45
11	1941	.51	1.23	143.92	.714	.699	3.499	143.556	97	76	71	4	260	255	45
12	1946	.49	1.18	147.59	.700	.686	3.430	147.055	97	76	70	4	261	260	45
	1951			150.603				150.485							

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & Metal

UNIT NO: NW Baghouse

LOCATION: Stack

DATE: 10.6.15

TEST NO: 3 (B)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: S10-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	738.7	735.7		
IMPINGER 2	727.4	715.1		
IMPINGER 3	644.8	643.2		
IMPINGER 4	824.3	809.7		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2110.9 2094.0 16.9
 FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 14.6
 FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Appendix G - Calibration Data

MOSTARDI PLATT

Procedures for Method 5 and Flow Calibration

Nozzles

The nozzles are measured according to Method 5, Section 10.1

Dry Gas Meters

The test meters are calibrated according to Method 5, Section 10.3 and "Procedures for Calibrating and Using Dry Gas Volume Meters as Calibration Standards" by P.R. Westlin and R.T. Shigehara, March 10, 1978.

Analytical Balance

The accuracy of the analytical balance is checked with Class S, Stainless Steel Type 303 weights manufactured by F. Hopken and Son, Jersey City, New Jersey.

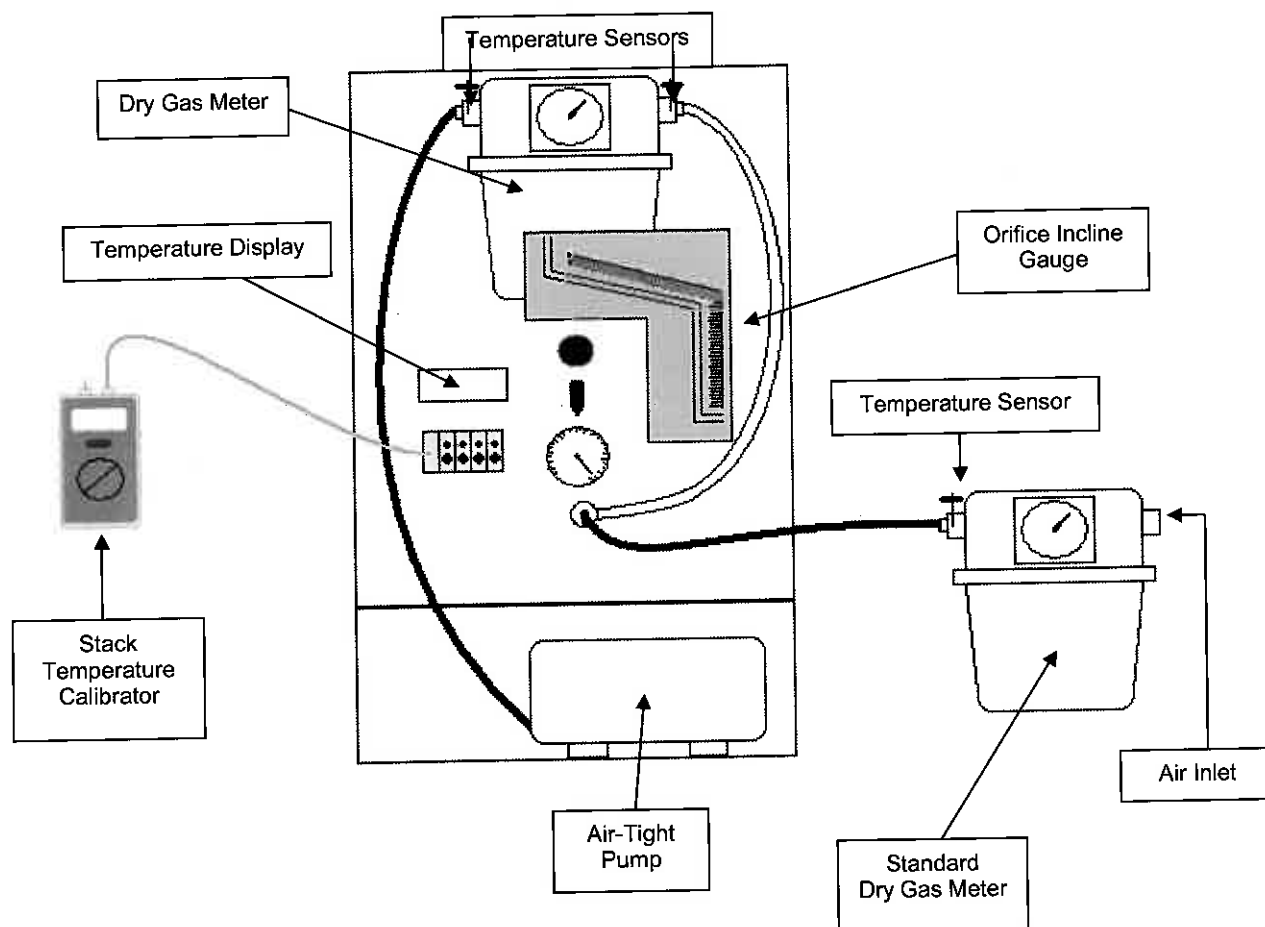
Temperature Sensing Devices

The potentiometer and thermocouples are calibrated utilizing a NBS traceable millivolt source.

Pitot Tubes

The pitot tubes utilized during this test program are manufactured according to the specification described and illustrated in the *Code of Federal Regulations*, Title 40, Part 60, Appendix A, Methods 1 and 2. The pitot tubes comply with the alignment specifications in Method 2, Section 10.1; and the pitot tube assemblies are in compliance with specifications in the same section.

Dry Gas Meter/Control Module Calibration Diagram



Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No. CM33
 Standard Meter No. 16745468
 Standard Meter (Y) 1.0006

Date: September 28, 2015
 Calibrated By: NCC
 Barometric Pressure: 29.29

Run Number	Orifice Setting in H ₂ O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		63.935	91.944	69	76	74					
Initial		58.933	86.806	68	73	72					
Difference 1	0.20	5.002	5.138	69	75	73	74	19	30	0.983	1.728
Final		69.653	97.680	69	77	75					
Initial		64.550	92.560	69	74	75					
Difference 2	0.50	5.103	5.120	69	76	75	75	12	44	1.008	1.768
Final		75.378	103.433	69	77	75					
Initial		70.113	98.145	69	76	75					
Difference 3	0.70	5.265	5.288	69	77	75	76	11	10	1.007	1.787
Final		80.949	109.032	69	77	75					
Initial		75.755	103.812	69	76	75					
Difference 4	0.90	5.194	5.220	69	77	75	76	9	30	1.006	1.708
Final		86.638	114.743	69	77	74					
Initial		81.442	109.527	69	76	75					
Difference 5	1.20	5.196	5.216	69	77	75	76	8	12	1.006	1.697
Final		58.648	86.625	68	73	72					
Initial		53.091	81.102	68	71	70					
Difference 6	2.00	5.557	5.523	68	72	71	72	6	59	1.008	1.800

Average 1.003 1.748

Stack Temperature Sensor Calibration

Meter Box # : CM33

Name : NCC

Ambient Temperature : 74 °F

Date : September 28, 2015

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2014

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (° F)	Test Thermometer Temperature (° F)	Temperature Difference %
0	-3	0.7
250	246	0.6
600	595	0.5
1200	1198	0.1

$$\frac{(\text{Ref. Temp., } ^\circ\text{F} + 460) - (\text{Test Therm. Temp., } ^\circ\text{F} + 460)}{\text{Ref. Temp., } ^\circ\text{F} + 460} * 100 \leq 1.5 \%$$

Ref. Temp., °F + 460

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No.
Standard Meter No.
Standard Meter (Y)

CM33
4319699
1.0053

Date:
Calibrated By:
Barometric Pressure:

October 29, 2015
KAG
28.76

Run Number	Orifice Setting in H ₂ O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		88.282	11.562	56	61	61					
Initial		83.267	6.538	55	57	57					
Difference	1	5.015	5.024	56	59	59	59	18	24	1.010	1.511
Final		93.417	16.712	56	64	62					
Initial		88.396	11.677	56	61	61					
Difference	2	5.021	5.035	56	63	62	62	12	2	1.013	1.605
Final		98.713	22.022	56	65	63					
Initial		93.576	16.882	56	64	63					
Difference	3	5.137	5.140	56	65	63	64	10	32	1.018	1.640
Final		604.908	28.234	57	66	63					
Initial		598.924	22.231	56	65	63					
Difference	4	5.984	6.003	57	66	63	64	10	26	1.015	1.526
Final		10.382	33.729	57	66	63					
Initial		5.153	28.482	57	66	63					
Difference	5	5.229	5.247	57	66	63	65	8	27	1.013	1.750
Final		83.143	6.414	55	56	56					
Initial		78.057	1.384	55	55	55					
Difference	6	5.086	5.030	55	56	56	56	6	15	1.012	1.703
Average										1.014	1.622

Stack Temperature Sensor Calibration

Meter Box # : CM33

Name : KAG

Ambient Temperature : 59 °F

Date : October 29, 2015

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2014

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-3	0.7
250	246	0.6
600	595	0.5
1200	1198	0.1

$$\frac{(\text{Ref. Temp., } ^\circ\text{F} + 460) - (\text{Test Therm. Temp., } ^\circ\text{F} + 460)}{\text{Ref. Temp., } ^\circ\text{F} + 460} * 100 \leq 1.5 \%$$

Ref. Temp., °F + 460

S TYPE PITOT TUBE INSPECTION WORKSHEET

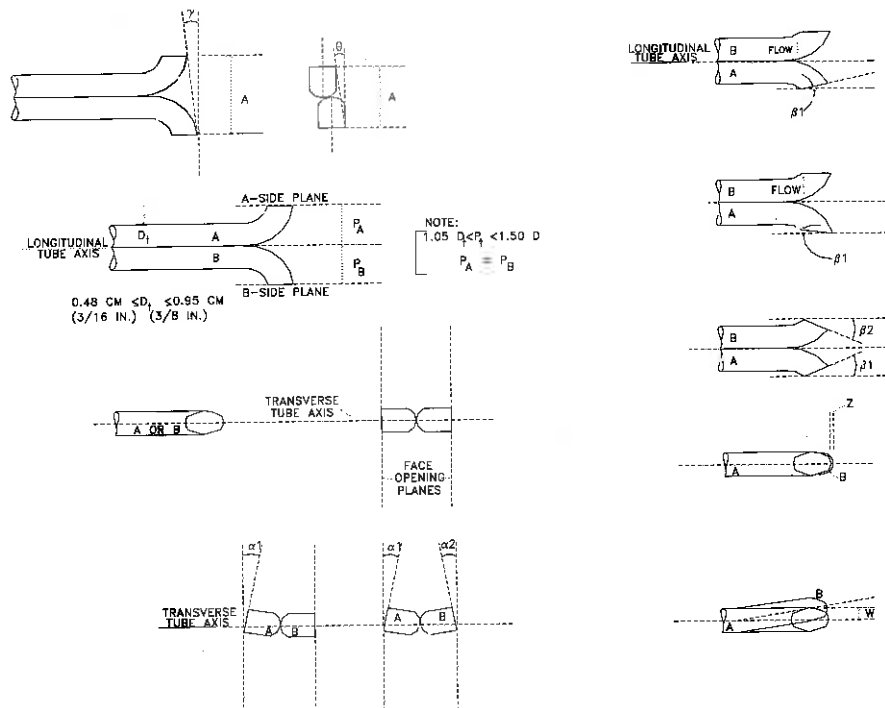
Pitot Tube No 256

Date: 8/28/2015

Inspectors Name: PMR1

Type of Probe: (circle one) M2 M5 M17

Probe Length: 3 ft.



Pitot tube assembly level? ☒ yes ☐ no

Pitot tube openings damaged? ☐ yes (explain below) ☒ no

$a_1 = 0.5^\circ (<10^\circ)$, $a_2 = 1^\circ (<10^\circ)$

$z = A \sin g = 0.017$ (in.); (<0.125 in.)

$b_1 = 0.5^\circ (<5^\circ)$, $b_2 = 1^\circ (<5^\circ)$

$w = A \sin q = 0.008$ (in.); (<0.03125 in.)

$\gamma = 1^\circ$, $\theta = 0.5^\circ$, $A = 0.970$ (in.)

$P_A = 0.470$ (in.), $P_B = 0.470$ (in.), $D_1 = 0.375$ (in.)

Calibration required? ☐ yes ☒ no

S TYPE PITOT TUBE INSPECTION WORKSHEET

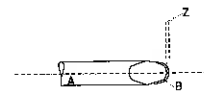
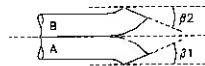
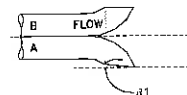
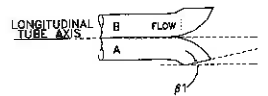
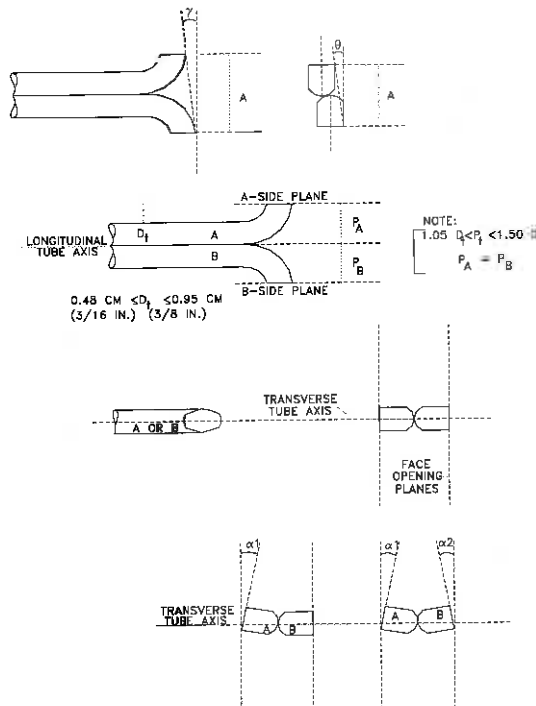
Pitot Tube No. 256

Date: 10/9/2015

Inspectors Name: DJK

Type of Probe: (circle one) M2 M5 M17

Probe Length: 3 ft.



Pitot tube assembly level? ☒ yes ☐ no

Pitot tube openings damaged? ☐ yes (explain below) ☒ no

$a_1 = 2.5^\circ (<10^\circ)$, $a_2 = 3^\circ (<10^\circ)$

$z = A \sin g = 0.033$ (in.); (<0.125 in.)

$b_1 = 1^\circ (<5^\circ)$, $b_2 = 0.5^\circ (<5^\circ)$

$w = A \sin q = 0.025$ (in.); (<0.03125 in.)

$\gamma = 2^\circ$, $\theta = 1.5^\circ$, $A = 0.946$ (in.)

$P_A = 0.470$ (in.), $P_B = 0.470$ (in.), $D_1 = 0.375$ (in.)

Calibration required? ☐ yes ☒ no

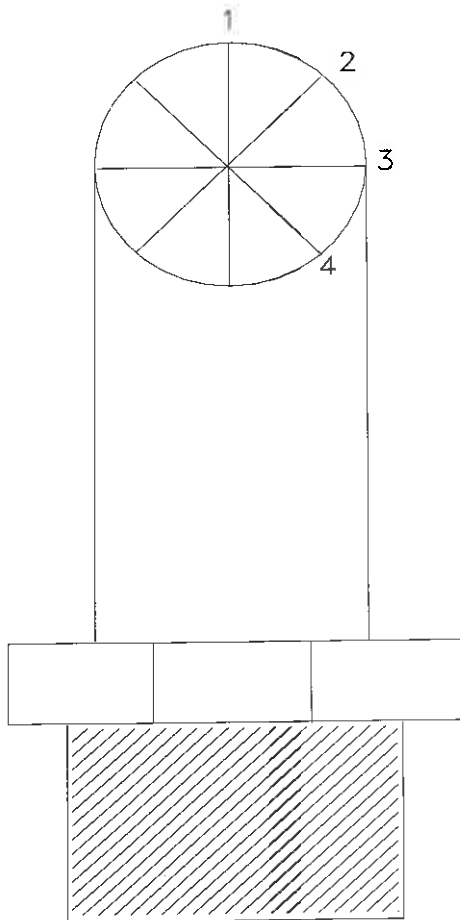
Nozzle Calibration

Date: 3/2/2015

Nozzle ID No.: 268

Analyst: BPT

Material/Type: Glass



<u>0.310</u>	1
<u>0.311</u>	2
<u>0.310</u>	3
<u>0.309</u>	4

Valid Data

Average
<u>0.310</u>

Meter Box Calibration

Dry Gas Meter Calibration Data

September 18, 2015
JHK
29.12

Date:
Calibrated By:
Barometric Pressure:

CM26
1675468
1.0056

Dry Gas Meter No.
Standard Meter No.
Standard Meter (Y)

Run Number	Orifice Setting in H ₂ O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		50.960	67.675	76	76	73					
Initial		45.770	62.390	75	76	73					
Difference 1	0.20	5.190	5.285	76	76	73	75	20	0	0.985	1.724
Final		45.636	62.250	75	77	73					
Initial		40.410	56.937	74	75	72					
Difference 2	0.50	5.226	5.313	75	76	73	74	12	30	0.987	1.655
Final		40.074	56.608	74	76	73					
Initial		34.230	50.690	75	75	73					
Difference 3	0.70	5.844	5.918	75	76	73	74	12	0	0.991	1.707
Final		33.790	50.257	74	76	72					
Initial		27.927	44.334	73	75	72					
Difference 4	0.90	5.863	5.923	74	76	72	74	10	30	0.994	1.665
Final		27.379	43.775	73	75	72					
Initial		21.745	38.105	73	73	71					
Difference 5	1.20	5.634	5.670	73	74	72	73	9	0	0.996	1.766
Final		57.954	74.758	76	79	73					
Initial		51.326	68.050	76	76	73					
Difference 6	2.00	6.628	6.708	76	78	73	75	8	0	0.987	1.692

Average 0.990 1.702

Stack Temperature Sensor Calibration

Meter Box # : CM26

Name : JHK

Ambient Temperature : 78.1 °F

Date : September 18, 2015

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2014

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-1	0.2
250	248	0.3
600	598	0.2
1200	1199	0.1

$$\frac{(\text{Ref. Temp., } ^\circ\text{F} + 460) - (\text{Test Therm. Temp., } ^\circ\text{F} + 460)}{\text{Ref. Temp., } ^\circ\text{F} + 460} * 100 \leq 1.5 \%$$

Ref. Temp., °F + 460

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No.
Standard Meter No.
Standard Meter (Y)

CM26
4319699
1.0053

Date:
Calibrated By:
Barometric Pressure:

October 12, 2015
ALD
28.88

Run Number	Office Setting in H ₂ O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		785.204	721.010	66	68	67					
Initial		779.376	715.106	65	67	66					
Difference	1	5.828	5.904	66	68	67	67	22	54	0.995	1.766
Final		790.504	726.426	66	70	68					
Initial		785.423	721.211	66	68	67					
Difference	2	5.081	5.215	66	69	68	68	12	45	0.982	1.800
Final		796.273	732.190	67	71	69					
Initial		790.751	726.603	67	70	68					
Difference	3	5.522	5.587	67	71	69	70	11	38	0.997	1.779
Final		802.878	738.889	67	71	69					
Initial		796.475	732.417	67	70	69					
Difference	4	6.403	6.472	67	71	69	70	11	55	0.997	1.784
Final		808.174	744.244	67	72	69					
Initial		803.065	739.078	67	71	69					
Difference	5	5.109	5.166	67	72	69	70	8	16	0.997	1.796
Final		779.189	714.924	65	68	65					
Initial		774.024	709.714	65	66	65					
Difference	6	5.165	5.210	65	67	65	66	6	28	0.993	1.793
Average										0.994	1.786

Stack Temperature Sensor Calibration

Meter Box # : CM26 Name : ALD

Ambient Temperature : 68 °F Date : October 12, 2015

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2014

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-2	0.4
250	247	0.4
600	597	0.3
1200	1199	0.1

$$\frac{(\text{Ref. Temp., } ^\circ\text{F} + 460) - (\text{Test Therm. Temp., } ^\circ\text{F} + 460)}{\text{Ref. Temp., } ^\circ\text{F} + 460} * 100 \leq 1.5 \%$$

Ref. Temp., °F + 460

S TYPE PITOT TUBE INSPECTION WORKSHEET

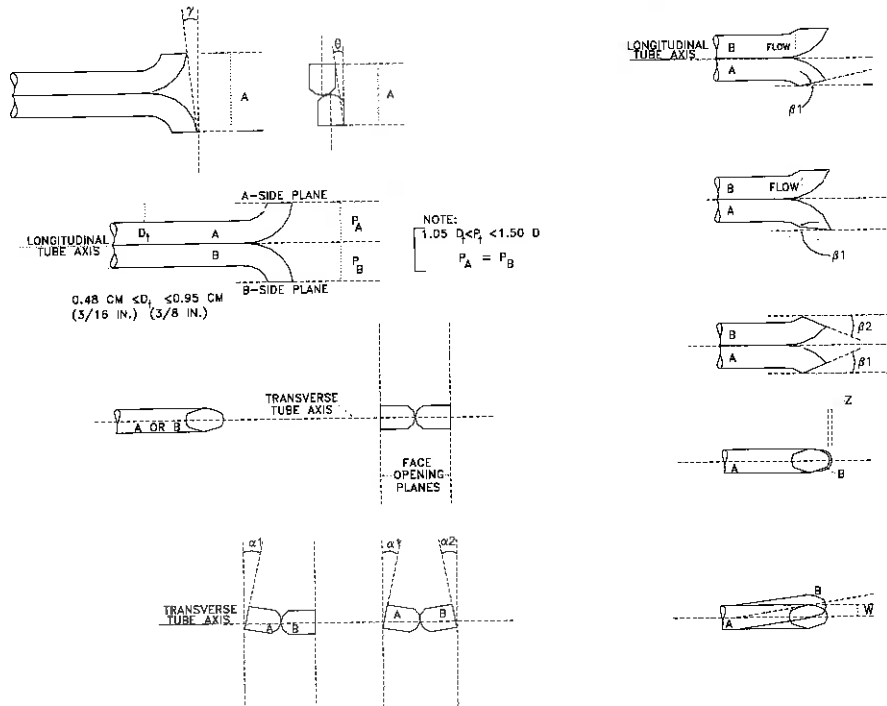
Pitot Tube No: 170

Date: 4/24/2015

Inspector's Name: JCS1

Type of Probe: (circle one) M2 M5 M17

Probe Length: 5 ft.



Pitot tube assembly level? ☒ yes ☐ no

Pitot tube openings damaged? ☐ yes (explain below) ☒ no

$a_1 = 0^\circ (<10^\circ)$, $a_2 = 1.5^\circ (<10^\circ)$
 $b_1 = 2^\circ (<5^\circ)$, $b_2 = 1^\circ (<5^\circ)$
 $\gamma = 1^\circ$, $\theta = 1.5^\circ$, $A = 1.130$ (in.)

$z = A \sin g = 0.020$ (in.); (<0.125 in.)

$w = A \sin q = 0.030$ (in.); (<0.03125 in.)

$P_A = 0.565$ (in.), $P_B = 0.565$ (in.), $D_t = 0.375$ (in.)

Calibration required? ☐ yes ☒ no

S TYPE PITOT TUBE INSPECTION WORKSHEET

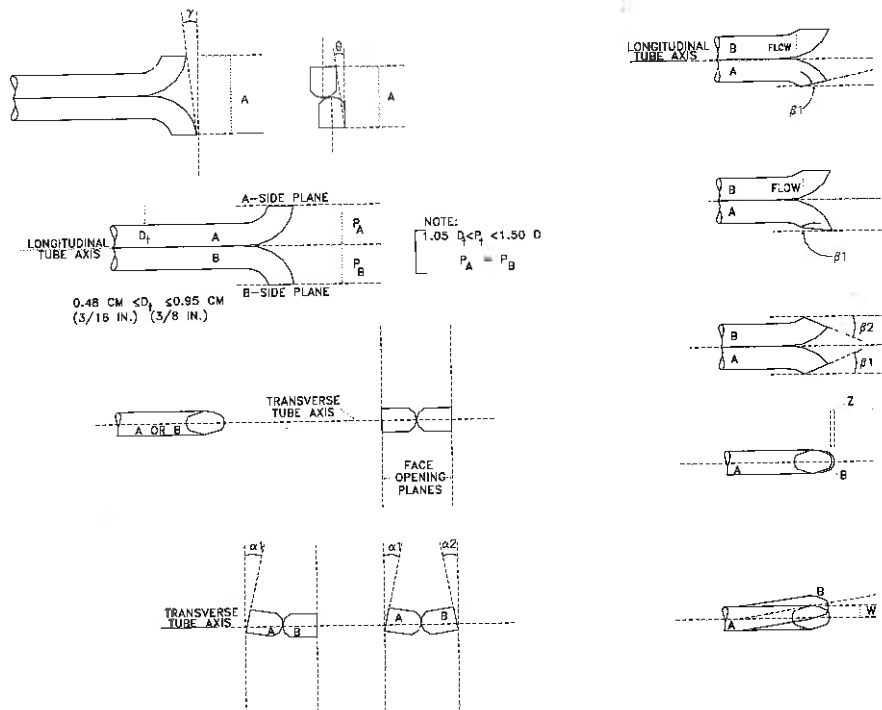
Pitot Tube No: 170

Date: 10/9/2015

Inspector's Name: DJK

Type of Probe: (circle one) M2 **M5** M17

Probe Length: 5 ft.



Pitot tube assembly level? x yes no

Pitot tube openings damaged? yes (explain below) x no

$a_1 =$ 1.5 ° (<10°),

$a_2 =$ 3 ° (<10°)

$z = A \sin g =$ 0.020 (in.); (<0.125 in.)

$b_1 =$ 0.5 ° (<5°),

$b_2 =$ 0.5 ° (<5°)

$w = A \sin q =$ 0.029 (in.); (<0.03125 in.)

$\gamma =$ 1 °, $\theta =$ 1.5 °, $A =$ 1.126 (in.)

$P_A =$ 0.563 (in.), $P_B =$ 0.563 (in.), $D_t =$ 0.375 (in.)

Calibration required? yes x no

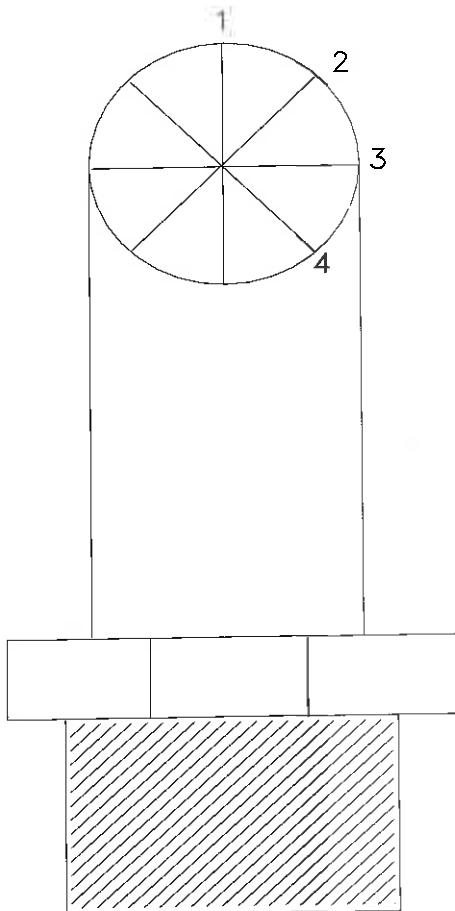
Nozzle Calibration

Date: 2/23/2015

Nozzle ID No.: 7T-8

Analyst: KJC

Material/Type: Teflon Coated



0.243 1

0.242 2

0.242 3

0.242 4

Average
<u>0.242</u>

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No. CM 15 Date: September 25, 2015
 Standard Meter No. 16745468 Calibrated By: ALD
 Standard Meter (Y) 1.0006 Barometric Pressure: 29.50

Run Number	Orifice Setting in H ₂ O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		922.180	251.328	69	72	71					
Initial		917.535	246.585	69	71	70					
Difference	1	4.645	4.743	69	72	71	71	16	26	0.983	1.423
Final		927.673	256.935	69	74	71					
Initial		922.633	251.789	69	72	71					
Difference	2	5.040	5.146	69	73	71	72	11	42	0.984	1.529
Final		933.315	262.662	70	75	72					
Initial		928.050	257.303	70	73	72					
Difference	3	5.265	5.359	70	74	72	73	10	15	0.987	1.508
Final		939.211	268.649	70	76	73					
Initial		933.915	263.266	70	74	72					
Difference	4	5.296	5.383	70	75	73	74	8	52	0.989	1.432
Final		944.747	274.256	70	76	73					
Initial		939.630	269.055	70	75	73					
Difference	5	5.117	5.201	70	76	73	74	7	28	0.989	1.449
Final		917.166	246.215	68	71	69					
Initial		911.558	240.576	68	70	69					
Difference	6	5.608	5.639	68	71	69	70	6	38	0.993	1.588

Average **0.988** **1.488**

Stack Temperature Sensor Calibration

Meter Box # : CM 15

Name : ALD

Ambient Temperature : 74 °F

Date : September 25, 2015

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2014

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-4	0.9
250	245	0.7
600	595	0.5
1200	1198	0.1

$$\frac{(\text{Ref. Temp., } ^\circ\text{F} + 460) - (\text{Test Therm. Temp., } ^\circ\text{F} + 460)}{\text{Ref. Temp., } ^\circ\text{F} + 460} * 100 \leq 1.5 \%$$

Ref. Temp., °F + 460

Meter Box Calibration

Dry Gas Meter Calibration Data

Dry Gas Meter No. CM15 Date: October 26, 2015
 Standard Meter No. 4319699 Calibrated By: EWK
 Standard Meter (Y) 1.0053 Barometric Pressure: 29.59

Run Number	Orifice Setting in H ₂ O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		55.722	31.392	56	58	57					
Initial		50.515	26.050	55	57	56					
Difference 1	0.20	5.207	5.342	56	58	57	57	18	58	0.982	1.453
Final		61.968	37.769	57	59	59					
Initial		55.823	31.494	56	58	57					
Difference 2	0.50	6.145	6.275	57	59	58	58	14	10	0.987	1.457
Final		67.391	43.291	57	62	59					
Initial		62.080	37.883	57	59	59					
Difference 3	0.70	5.311	5.408	57	61	59	60	10	25	0.991	1.475
Final		77.890	53.999	57	64	60					
Initial		67.532	43.426	57	61	59					
Difference 4	0.90	10.358	10.573	57	63	60	61	18	18	0.990	1.535
Final		85.156	61.416	58	66	61					
Initial		78.015	54.130	57	62	60					
Difference 5	1.20	7.141	7.286	58	64	61	62	11	29	0.991	1.695
Final		50.402	25.932	55	58	56					
Initial		45.316	20.790	55	56	56					
Difference 6	2.00	5.086	5.142	55	57	56	57	6	13	0.992	1.634

Average **0.989** **1.542**

Stack Temperature Sensor Calibration

Meter Box # : CM15 Name : EWK

Ambient Temperature : 59 °F Date : October 26, 2015

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2014

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-3	0.7
250	246	0.6
600	596	0.4
1200	1199	0.1

$$\frac{(\text{Ref. Temp., } ^\circ\text{F} + 460) - (\text{Test Therm. Temp., } ^\circ\text{F} + 460)}{\text{Ref. Temp., } ^\circ\text{F} + 460} * 100 \leq 1.5 \%$$

Ref. Temp., °F + 460

S TYPE PITOT TUBE INSPECTION WORKSHEET

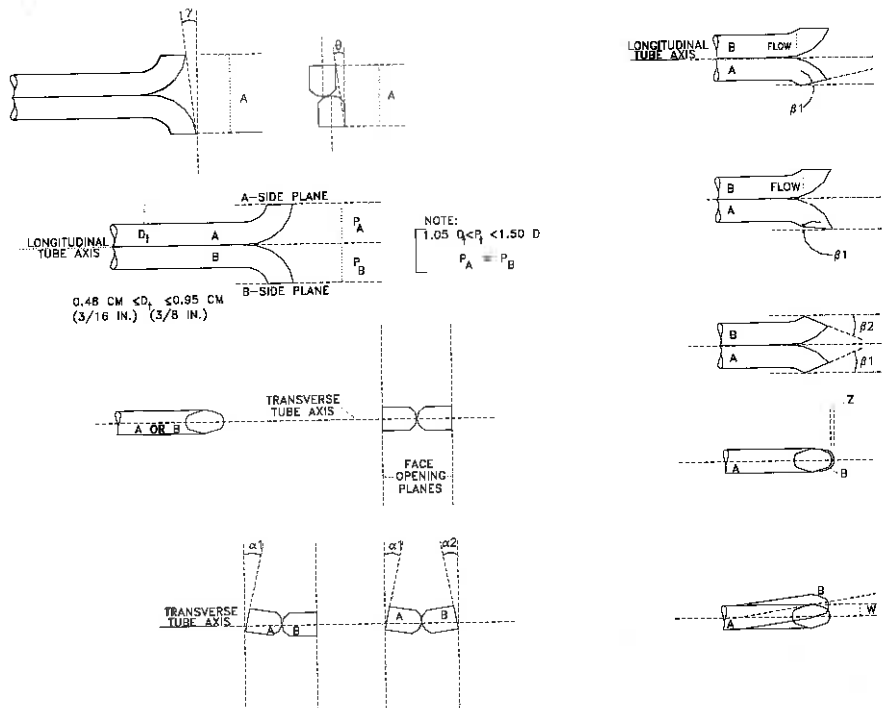
Pitot Tube No: 170

Date: 4/24/2015

Inspector's Name: JCS1

Type of Probe: (circle one) M2 **M5** M17

Probe Length: 4 ft.



Pitot tube assembly level? x yes no

Pitot tube openings damaged? yes (explain below) x no

$a_1 =$ 0 ° ($< 10^\circ$),

$a_2 =$ 1.5 ° ($< 10^\circ$)

$z = A \sin g =$ 0.020 (in.); (< 0.125 in.)

$b_1 =$ 2 ° ($< 5^\circ$),

$b_2 =$ 1 ° ($< 5^\circ$)

$w = A \sin q =$ 0.030 (in.); (< 0.03125 in.)

$\gamma =$ 1 °, $\theta =$ 1.5 °, $A =$ 1.130 (in.)

$P_A =$ 0.565 (in.), $P_B =$ 0.565 (in.), $D_t =$ 0.375 (in.)

Calibration required? yes x no

S TYPE PITOT TUBE INSPECTION WORKSHEET

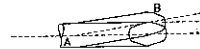
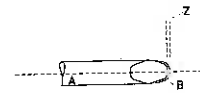
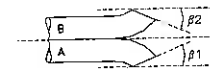
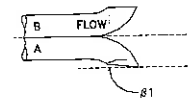
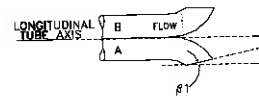
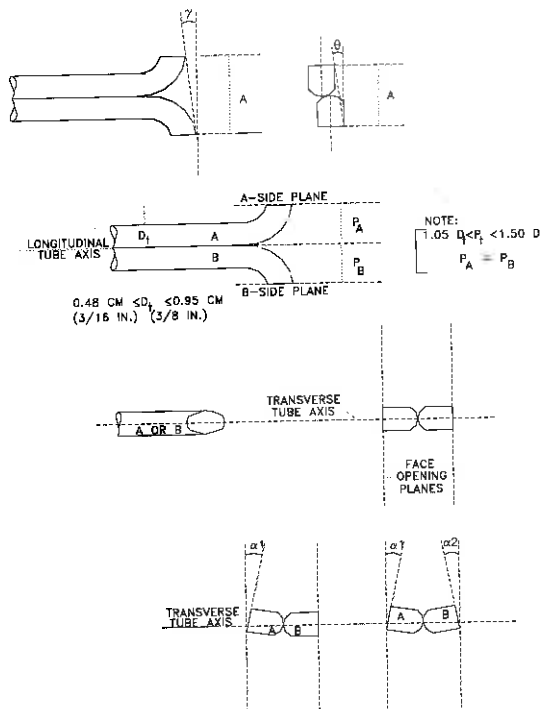
Pitot Tube No: 170

Date: 10/9/2015

Inspector's Name: DJK

Type of Probe: (circle one) M2 M5 M17

Probe Length: 4 ft.



Pitot tube assembly level? x yes no

Pitot tube openings damaged? yes (explain below) x no

$a_1 = 1.5^\circ (<10^\circ)$, $a_2 = 3^\circ (<10^\circ)$

$b_1 = 0.5^\circ (<5^\circ)$, $b_2 = 0.5^\circ (<5^\circ)$

$\gamma = 1^\circ$, $\theta = 1.5^\circ$, $A = 1.126$ (in.)

$z = A \sin g = 0.020$ (in.); (<0.125 in.)

$w = A \sin q = 0.029$ (in.); (<0.03125 in.)

$P_A = 0.563$ (in.), $P_B = 0.563$ (in.), $D_1 = 0.375$ (in.)

Calibration required? yes x no

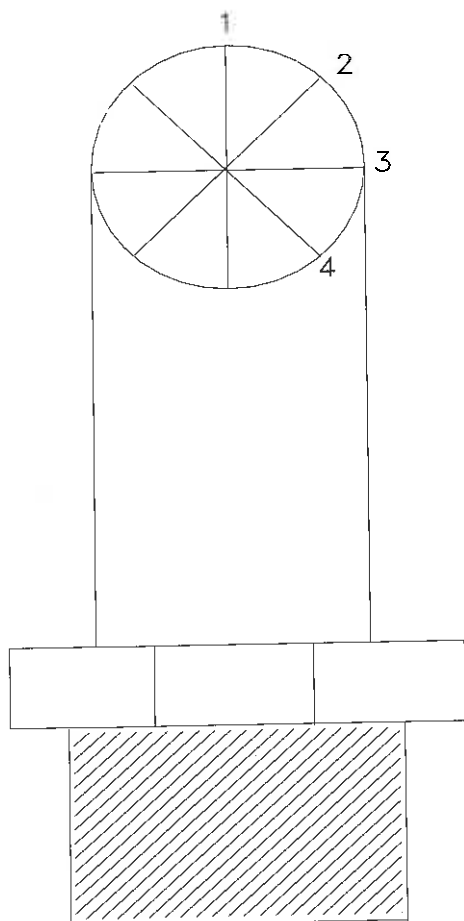
Nozzle Calibration

Date: 9/3/2015

Nozzle ID No.: 351

Analyst: ECS1

Material/Type: Glass



<u>0.230</u>	1
<u>0.230</u>	2
<u>0.230</u>	3
<u>0.230</u>	4

Average
<u>0.230</u>

WEIGHING
SOLUTIONS
INC.

SALES-SERVICE-RENTALS
3310-14 N. HARLEM AVENUE
CHICAGO, IL 60634

PHONE
773-836-2800
FAX
773-836-2891

CALIBRATION REPORT

Company Name MOSTACCI PLATT
Date OCTOBER 14, 2015
Location LAB
Weight Set # E559

Model # E 0640
Serial/ID # 6045121051238
Manufacturer Ohaus
Tolerance ± 0.05%

Capacity 62g
Readability 0.1mg
Weight # 1 0.1mg
Weight # 2 1g
Weight # 3 10g
Weight # 4 20g
Weight # 5 50g

Before Cal.:

0.0001g
1.0000g
10.0000g
20.0002g
50.0005g

After Cal.:

0.0001g
1.0000g
10.0000g
20.0000g
50.0000g

	Accept	Reject
Linearity	<u>✓</u>	<u>_____</u>
Cornerload	<u>✓</u>	<u>_____</u>
Repeatability	<u>✓</u>	<u>_____</u>
Hysteresis	<u>✓</u>	<u>_____</u>

Comments Cleaned and adjusted calibration to N.I.S.T. specifications.

[Signature]
Technician
678

State Of IL Registration



State of Illinois



Department of Agriculture

Bureau of Weights and Measures

Registered Service Company Certificate of Registration

Registration Number: 1604

Expires: 02/28/2016

This is to certify that the named company has met all requirements
for registration with this office for weighing devices.

Issued To:

WEIGHING SOLUTIONS, INC.
3310-14 N HARLEM AVE
CHICAGO, IL 60634

A handwritten signature in cursive script, reading "Douglas R. Hartman".

Bureau Chief
Bureau of Weights & Measures

Pre/Post	Date	Time	Analyst	Ambient Temperature degrees F	Relative Humidity %	Barometric Pressure inches Hg	Calibration Standard 50.0000g	% Error	Calibration Standard 5.0000g	% Error	Calibration Standard 0.5000g	% Error
Pre	10/5/2015	8:00 AM	JLS	69	34.0	29.50	49.9997 g	0.00	4.9999 g	0.00	0.5001 g	-0.02
Post	10/5/2015	3:30 PM	JLS	72	33.0	29.50	49.9997 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Pre	10/6/2015	7:30 AM	JLS	69	36.0	29.47	49.9998 g	0.00	5.0000 g	0.00	0.5003 g	-0.06
Post	10/6/2015	3:00 PM	JLS	73	33.0	29.50	49.9995 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Pre	10/7/2015											
Post	10/7/2015											
Pre	10/8/2015											
Post	10/8/2015											
Pre	10/9/2015											
Post	10/9/2015											
Pre	10/12/2015	7:00 AM	JMG	70	28.0	29.08	49.9996 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Post	10/12/2015	3:00 PM	JMG	70	28.0	29.00	49.9995 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Pre	10/13/2015	8:00 AM	JMG	70	25.0	29.00	49.9998 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Post	10/13/2015	3:00 PM	JMG	70	25.0	29.00	49.9998 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Pre	10/14/2015	8:00 AM	JMG	67	26.0	29.26	49.9998 g	0.00	5.0000 g	0.00	0.5001 g	-0.02
Post	10/14/2015	2:30 PM	JLS	70	24.0	29.35	49.9993 g	0.00	4.9999 g	0.00	0.5003 g	-0.06
Pre	10/15/2015	7:00 AM	JMG	69	25.0	29.32	49.9998 g	0.00	4.9999 g	0.00	0.5001 g	-0.02
Post	10/15/2015	1:30 PM	JMG	69	25.0	29.32	49.9998 g	0.00	4.9999 g	0.00	0.5001 g	-0.02
Pre	10/16/2015	8:00 AM	JLS	66	24.0	29.53	49.9994 g	0.00	5.0000 g	0.00	0.5004 g	-0.08
Post	10/16/2015	2:30 PM	JLS	68	24.0	29.62	49.9991 g	0.00	5.0001 g	0.00	0.5000 g	0.00
Pre	10/19/2015											
Post	10/19/2015											
Pre	10/20/2015	8:00 AM	JMG	70	23.0	29.41	50.0001 g	0.00	5.0000 g	0.00	0.5002 g	-0.04
Post	10/20/2015	9:00 AM	JMG	70	23.0	29.41	50.0001 g	0.00	5.0000 g	0.00	0.5002 g	-0.04
Pre	10/21/2015	9:00 AM	JMG	69	26.0	29.44	49.9999 g	0.00	5.0002 g	0.00	0.5002 g	-0.04
Post	10/21/2015	10:00 AM	JMG	70	25.0	29.44	49.9999 g	0.00	5.0002 g	0.00	0.5002 g	-0.04
Pre	10/22/2015	2:00 PM	JMG	68	24.0	29.50	49.9999 g	0.00	5.0001 g	0.00	0.5002 g	-0.04
Post	10/22/2015	2:15 PM	JMG	68	24.0	29.50	49.9999 g	0.00	5.0001 g	0.00	0.5002 g	-0.04
Pre	10/23/2015	8:00 AM	JMG	68	27.0	29.56	49.9999 g	0.00	5.0001 g	0.00	0.5000 g	0.00
Post	10/23/2015	3:00 PM	JMG	68	28.0	29.56	49.9999 g	0.00	5.0001 g	0.00	0.5000 g	0.00

Balance IC OHAUS Model Explorer
GO451121051238

Appendix H - Gas Cylinder Certifications

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E03NI78E15A1066 Reference Number: 54-124500021-7
Cylinder Number: CC89223 Cylinder Volume: 151.1 CF
Laboratory: ASG - Chicago - IL Cylinder Pressure: 2015 PSIG
PGVP Number: B12015 Valve Outlet: 590
Gas Code: CO2,O2,BALN Certification Date: Jun 23, 2015

Expiration Date: Jun 23, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	9.926 %	G1	+/- 1.0% NIST Traceable	06/23/2015
OXYGEN	12.00 %	11.98 %	G1	+/- 1.0% NIST Traceable	06/23/2015
NITROGEN	Balance				
CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	06120402	CC184369	19.66 % CARBON DIOXIDE/NITROGEN	+/- 0.5%	May 01, 2016
NTRM	06120204	CC195893	20.90 % OXYGEN/NITROGEN	+/- 0.4%	Dec 01, 2015
ANALYTICAL EQUIPMENT					
Instrument/Make/Model	Analytical Principle		Last Multipoint Calibration		
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR		Jun 12, 2015		
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic		Jun 16, 2015		

Triad Data Available Upon Request



Abdani Hussein

Approved for Release

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI59E15A3452	Reference Number:	54-124361680-5
Cylinder Number:	CC55028	Cylinder Volume:	159.0 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12013	Valve Outlet:	590
Gas Code:	CO2,O2	Certification Date:	Feb 25, 2013

Expiration Date: Feb 25, 2021

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	19.00 %	18.63 %	G1	+/- 1.4% NIST Traceable	02/25/2013
OXYGEN	22.00 %	21.96 %	G1	+/- 0.7% NIST Traceable	02/25/2013
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM/CO2	06120405	CC184974	19.66 % CARBON DIOXIDE/NITROGEN	+/- 0.5%	May 01, 2016
NTRM/O2	06120202	CC195927	20.9 % OXYGEN/NITROGEN	+/- 0.4%	Dec 01, 2015

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Jan 28, 2013
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Feb 20, 2013

Triad Data Available Upon

Request

Notes:

Approved for Release

Appendix I – Visible Emissions Data and Reader Certification

MOSTARDI PLATT

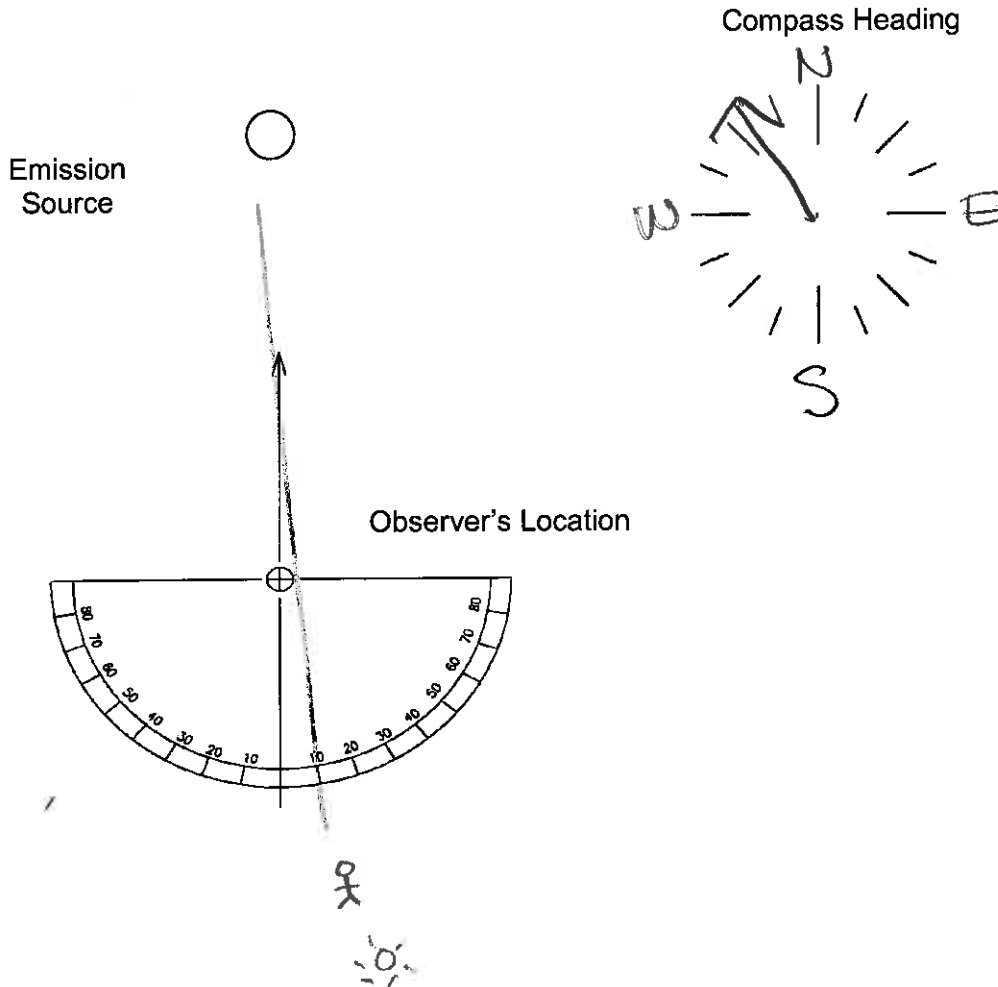
Visible Emissions Record Form

Date 10 / 6 / 15

Site Behr Iron & Metal
Rockford, IL

USEPA Method 9

Test # 1



Observer: M. Platt

Comments: 1. In Compliance
2. NW 3. 10mph
4. No Visible Plume
5. Normal

Note:

1. Sun Position
2. Wind Direction
3. Wind Speed
4. Plume Type
5. Operating Level

EPA Reference Method 9

Visible Emissions Observation Record Form

Sheet: 1 of 1

Facility Location:

R&A Associates, Inc.
Behr Iron & Metal
Rockford, IL
Northwest Outlet Stack

Date: 10/6/15

Observer: M. Platt

Observation Start: 12:00

End: 13:00

Test # 1

Observation Point:	<<	0	15	30	45	Notes	<<	0	15	30	45	Notes
Parking lot Southwest of Stack	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		30	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		31	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		32	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		33	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Distance from Source: <u>150</u> ft. Source Height: <u>50</u> ft. Emission Color: <u>NONE</u> Background: <u>Blue sky</u>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		34	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		35	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		36	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		37	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sky Condition: <u>Clear</u>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		38	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		39	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		40	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		41	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sun Position: <u>In Compliance</u> Temperature: <u>60</u> °F Wind Direction: <u>NW</u> at <u>10</u> mph Reading Conditions: <u>Fair</u>	12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		42	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		43	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		44	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		45	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Operating Conditions: <u>NORMAL</u>	16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		46	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		47	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		48	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		49	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Plume Description: <u>No Visible Plume</u> Attached or Detached	20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		50	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	21	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		51	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	22	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		52	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	23	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		53	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Signature: <u>Mark E. Platt</u>	24	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		54	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	25	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		55	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	26	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		56	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	27	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		57	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Certification Date: <u>9/2/15</u>	28	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		58	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	29	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		59	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Comments / Process Information:	Notes:					Notes:						

MOSTARDI PLATT

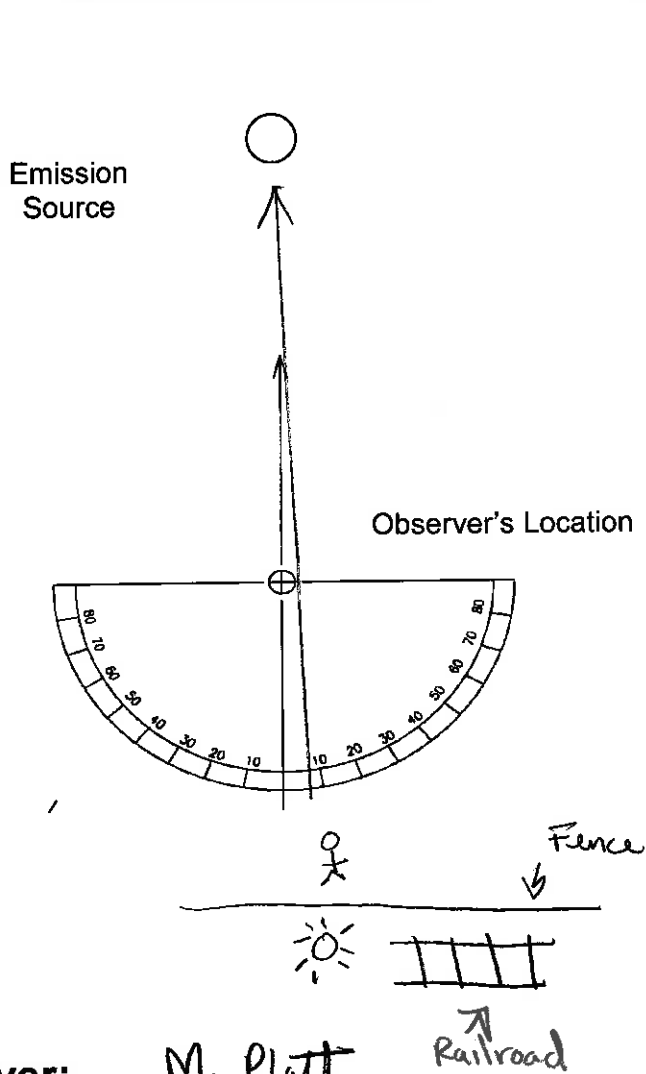
Visible Emissions Record Form

Date 10 / 6 / 15

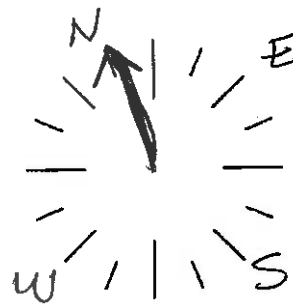
Site Behr Iron & Metal
Rockford, IL

USEPA Method 9

Test #2



Compass Heading



Observer: M. Platt

Comments: 1. In Compliance
2. NW 3 10 mph
4. No visible Plume
5. NORMAL

Note:

1. Sun Position
2. Wind Direction
3. Wind Speed
4. Plume Type
5. Operating Level

EPA Reference Method 9

Visible Emissions Observation Record Form

Sheet: 1 of 1

Facility Location:

RKA Associates, Inc.
Behr Iron & Metal
Rockford, IL
Northwest Outlet Stack

Date: 10/6/15

Observer: M. Platt

Observation Start: 15:00

End: 16:00

Test #2

Observation Point:
Parking lot
in the parking spaces by
the back fence

Distance from Source: 160 ft.

Source Height: 50 ft.

Emission Color: None

Background: Blue Sky

Sky Condition: Clear

Sun Position: In Compliance

Temperature: 60 °F

Wind Direction: NW at 10 mph

Reading Conditions: Good

Operating Conditions: NORMAL

Plume Description: No Visible

Plume

Attached or Detached

Signature: M. E. Platt

Certification Date: 9/2/15

Comments / Process Information:

<<	0	15	30	45	Notes	>>	0	15	30	45	Notes
0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		30	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		31	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		32	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		33	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		34	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		35	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		36	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		37	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		38	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		39	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		40	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		41	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		42	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		43	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		44	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		45	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		46	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		47	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		48	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
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21	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		51	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
22	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		52	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
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24	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		54	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
25	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		55	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
26	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		56	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
27	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		57	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
28	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		58	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
29	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		59	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Notes:

Notes:

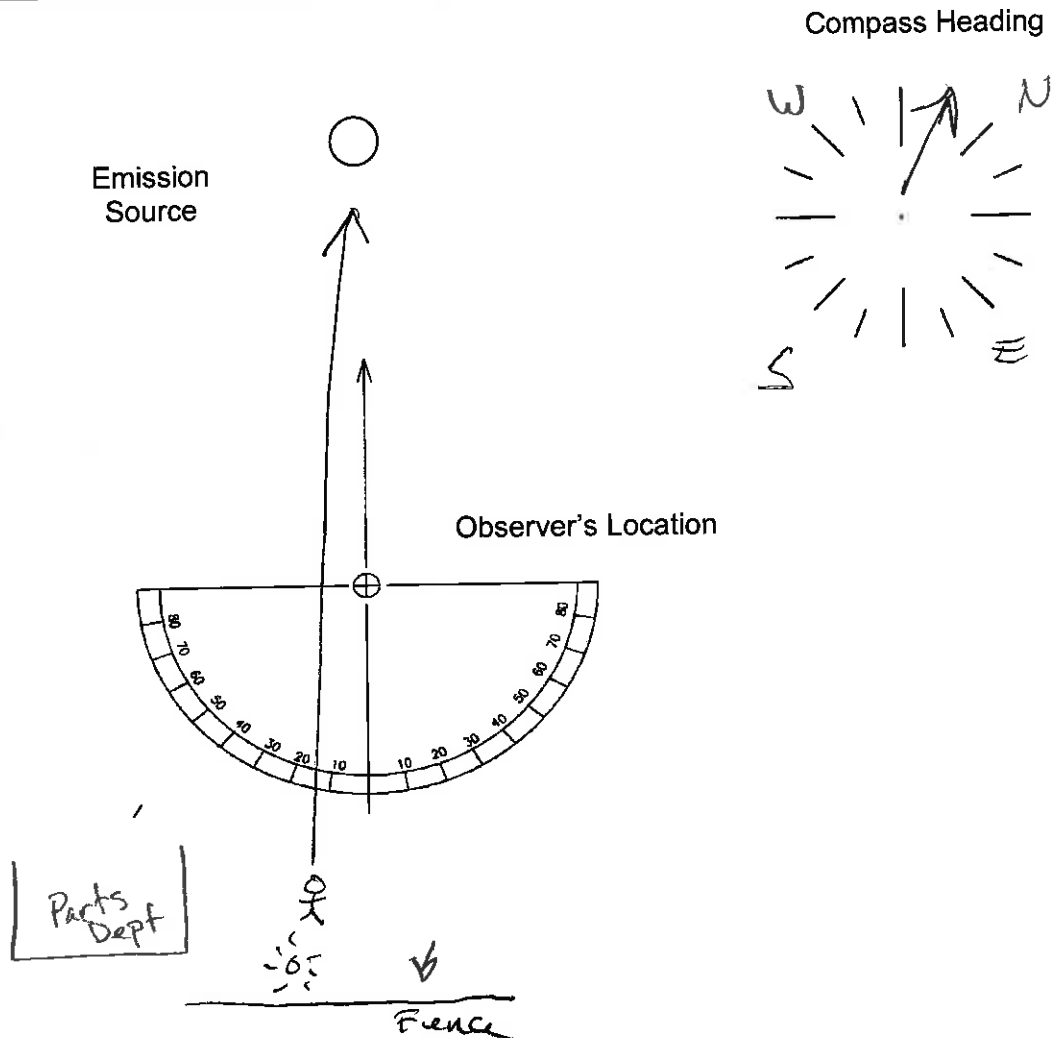
MOSTARDI PLATT

Visible Emissions Record Form

Date 10/6/15
Site Behr Iron & Metal
Rockford, IL

USEPA Method 9

Test #3



Observer: M. Platt

Comments: 1. In Compliance
2. NW 3. 10 mph
4. No visible Plume
5. Normal

Note:

1. Sun Position
2. Wind Direction
3. Wind Speed
4. Plume Type
5. Operating Level

EPA Reference Method 9

Visible Emissions Observation Record Form

Sheet: 1 of 1

Facility Location:

RK & Associates, INC.
Bohr Iron & Metal
Rockford, IL
Northwest Outlet Stack

Date: 10/6/15

Observer: M. Platt

Observation Start: 17:35

End: 18:35

Observation Point:	<<	0	15	30	45	Notes	>>	0	15	30	45	Notes
Parking lot Southeast of the source	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		30	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		31	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		32	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		33	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		34	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Distance from Source: <u>150</u> ft.	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		35	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Source Height: <u>50</u> ft.	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		36	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Emission Color: <u>NONE</u>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		37	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Background: <u>Blue sky</u>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		38	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sky Condition: <u>Clear</u>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		39	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Sun Position: <u>In Compliance</u>	10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		40	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Temperature: <u>60</u> °F	11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		41	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Wind Direction: <u>NW</u> at <u>5-10</u> mph	12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		42	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Reading Conditions: <u>Good</u>	13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		43	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Operating Conditions: <u>NORMAL</u>	14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		44	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		45	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		46	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		47	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		48	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Plume Description: <u>NO VISIBLE PLUME</u>	19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		49	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		50	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	21	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		51	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	22	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		52	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	23	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		53	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Attached or Detached	24	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		54	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	25	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		55	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	26	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		56	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	27	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		57	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	28	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		58	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Signature: <u>M. E. Platt</u>	29	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		59	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Certification Date: <u>9/2/15</u>											
Comments / Process Information:	Notes:					Notes:						



VISIBLE EMISSIONS EVALUATOR

Martin Platt

This is to certify that the above named observer has met the specifications of Federal Reference Method 9 and is qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates, Inc. of Raleigh, N.C. This certificate is valid for six months from date of issue.

433050
Certificate #

PLA465227
Student ID Number

9/2/2015
Date of Certification

Valparaiso, IN
Location

3/3/2016
Certification Expiration Date

NonETA
Last Lecture

Marty Hughes
Director of Training

END OF THE REPORT

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**Emission Test Report
Particulate and Metals Emissions
Behr Iron & Metal - Rockford, Illinois
Site ID No.: P201030AB**

January 19, 2016

**APPENDIX D
PARTICULATE MATTER AND
TRACE METAL EMISSIONS TEST REPORT
TPU BAGHOUSE**

Mostardi Plat Environmental Services

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Particulate Matter and Trace Metal Emissions Test Report

For: RK & Associates, Inc.
At: Behr Iron & Metal
Rockford Facility
Rotary Dryer Discharge
Rockford, Illinois
Report No. M154005C
October 7, 2015





**Particulate Matter and Trace Metal Emissions
Test Report**

**For: RK & Associates, Inc.
At: Behr Iron & Metal
Rockford Facility
Rotary Dryer Discharge
Rockford, Illinois
October 7, 2015**

**Report Submittal Date
January 19, 2016**

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Mostardi Platt

Report No. M154005C

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1.0 EXECUTIVE SUMMARY

MOSTARDI PLATT conducted a particulate matter and trace metals emissions test program for Behr Iron & Metal at their Rockford facility on the Rotary Dryer Discharge in Rockford, Illinois on October 7, 2015. This report summarizes the results of the test program and test methods used.

The test locations, test date, and test parameters are summarized below.

TEST INFORMATION		
Test Locations	Test Date	Test Parameters
Rotary Dryer Discharge	October 7, 2015	Filterable Particulate Matter (FPM), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Copper (Cu), Lead (Pb), Manganese (Mn), Nickel (Ni), Selenium (Se), Silver (Ag), and Zinc (Zn)

The purpose of the test program was to determine FPM and metal concentrations. Selected results of the test program are summarized below. A complete summary of emission test results follows the narrative portion of this report.

TEST RESULTS SUMMARY		
Test Location	Test Parameter	Concentrations ug/dscm
Rotary Dryer Discharge	Sb	< 14.19
	As	< 8.34
	Ba	< 62.65
	Be	< 2.08
	Cd	< 2.28
	Cr	1,239.51
	Co	422.44
	Cu	93,439.82
	Pb	1,042.50
	Mn	1,845.68
	Ni	13,576.13
	Se	< 29.09
	Ag	< 5.22
	Zn	19,378.12

The Stationary Source Audit Sample Program audit samples were obtained from ERA and submitted for analysis to Maxxam Analytical. The results of the audit samples were compared to the assigned value by ERA and found to be acceptable. The audit sample results and evaluation is appended to this report.

Due to the lack of volumetric flow at this test location, single point non isokinetic test runs were performed.

The identifications of the individuals associated with the test program are summarized below.

TEST PERSONNEL INFORMATION		
Location	Address	Contact
Test Coordinator	RK & Associates, Inc. 2S631 Route 59, Suite B Warrenville, Illinois 60555	Mr. John Pinion Associate Engineer (630) 393-9000 x 208 jpinion@rka-inc.com
Test Facility	Behr Iron & Metal 1100 Seminary Street Rockford, Illinois 61104	Mr. Ron Coupar Environmental Manager (815) 987-2770 rcoupar@behrim.com
Testing Company Representative	Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr. Mark Peterson Project Manager (630) 993-2100 (phone) mpeterson@mp-mail.com

The test crew consisted of Messrs. B. Schuler, B. Tarra, D. Kossack, J. Howe, K. Johnson, M. Karum, M. Lipinski, M. Platt, N. Colangelo, S. Cleary and M. Peterson of Mostardi Platt.

2.0 TEST METHODOLOGY

Emission testing was conducted following the methods specified in 40CFR60, Appendix A. A schematic of the test section diagrams are found in Appendix A and schematics of the sampling trains used are included in Appendix B. Calculation nomenclature and sample calculations are included in Appendix C. Laboratory analysis data are found in Appendix D. Copies of electronic data for each test run are included in Appendix E and field data sheets are found in Appendix F.

The following methodologies were used during the test program:

Method 1 Traverse Point Determination

Test measurement points were selected in accordance with Method 1. The characteristics of the measurement location are summarized below.

TEST POINT INFORMATION					
Test Location	Location Diameters	Upstream Diameters	Downstream Diameters	Test Parameters	Number of Sampling Points
Rotary Dryer Discharge	18 Inches	>0.5	>2.0	FPM, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Se, Ag, Zn	1

Absence of cyclonic flow tests were performed prior to testing at each location and each location met the minimum criteria.

Method 3A/3 Oxygen (O₂)/Carbon Dioxide (CO₂) Determination

Flue gas molecular weight was determined in accordance with Method 3A during the first test run. Servomex analyzers were used to determine stack gas oxygen and carbon dioxide content and, by difference, nitrogen content. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix G and copies of the gas cylinder certifications are found in Appendix H. For all additional test runs the flue gas molecular weight was determined in accordance with Method 3. A Fyrite analyzer was used to determine stack gas oxygen and carbon dioxide content and, by difference, nitrogen content.

Method 5 Filterable Particulate Matter Determination

Flue gas filterable particulate matter concentrations and emission rates were determined by a single point and at a constant rate of the delta H of the meter. The probe and filter housing were maintained at a temperature of 248 °F +/- 25°F. An Environmental Supply Company, Inc. sampling train was used. Four impingers were utilized, the first two each containing 100 ml of 0.1N Nitric Peroxide (N₂O₂), the third remained empty, and the fourth contained approximately 200 grams of silica gel. The impingers were weighed prior to and after each test run in order to determine moisture content of the stack gas. A minimum of 60 dry standard cubic feet was sampled for each run.

Particulate matter in the sample probe was recovered utilizing acetone; three passes of the probe brush through the entire probe was performed, followed by a visual inspection of the acetone exiting the probe. The acetone solution exiting the probe was clear, and therefore the wash was considered complete. The nozzle was then removed from the probe and cleaned in a similar manner, utilizing an appropriately sized nozzle brush. The filter and filter housing were recovered in a clean area. The filter housing was washed a minimum of three times with acetone and inspected for cleanliness, and the filter was placed in its corresponding petri dish. The acetone wash and the filter were labeled and marked, then analyzed at the Mostardi Platt Laboratory by Mostardi Platt personnel in accordance with the Method. All sample data analysis, are found in Appendix D. All of the equipment used is calibrated in accordance with the specifications of the Method. Calibration data are presented in Appendix G.

Method 29 Trace Metals Determination

Stack gas metals concentrations and emission rates were determined by a single point and at a constant rate of the delta H of the meter in conjunction with the Method 5 Sampling. An Environmental Supply Company, Inc. sampling train was used to sample stack gas. Analyses of the samples collected were conducted by Maxxam. Samples were analyzed for the following metals, using Inductively Coupled Argon Plasma emission spectroscopy (ICP): Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Selenium, Silver, and Zinc. All of the equipment used was calibrated in accordance with the specifications of the Method. Calibration data is presented in the Appendix G.

3.0 TEST RESULT SUMMARIES

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Rotary Dryer Discharge
 Test Method: 5/29

	Source Condition	Normal	Normal	Normal	
	Date	10/7/15	10/7/15	10/7/15	
	Start Time	8:20	11:05	13:48	
	End Time	10:20	13:05	15:48	
	Run 1	Run 2	Run 3	Average	
Stack Conditions					
Average Gas Temperature, °F	450.9	411.0	555.8	472.6	
Flue Gas Moisture, percent by volume	2.3%	2.2%	2.8%	2.4%	
Average Flue Pressure, in. Hg	29.02	29.35	29.35	29.24	
Gas Sample Volume, dscf	81.593	87.454	88.732	85.926	
Average Gas Velocity, ft/sec	0.000	0.000	0.000	0.000	
Gas Volumetric Flow Rate, acfm	0	0	0	0	
Gas Volumetric Flow Rate, dscfm	0	0	0	0	
Gas Volumetric Flow Rate, scfm	0	0	0	0	
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0	
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9	
Filterable Particulate Matter (Method 5)					
grams collected	0.7500	0.6159	0.9756	0.7805	
grains/dscf	0.1418	0.1087	0.1697	0.1401	

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Rotary Dryer Discharge
 Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/7/15	10/7/15	10/7/15	
Start Time	8:20	11:05	13:48	
End Time	10:20	13:05	15:48	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	450.9	411.0	555.8	472.6
Flue Gas Moisture, percent by volume	2.3%	2.2%	2.8%	2.4%
Average Flue Pressure, in. Hg	29.02	29.35	29.35	29.24
Gas Sample Volume, dscf	81.593	87.454	88.732	85.926
Average Gas Velocity, ft/sec	0.000	0.000	0.000	0.000
Gas Volumetric Flow Rate, acfm	0	0	0	0
Gas Volumetric Flow Rate, dscfm	0	0	0	0
Gas Volumetric Flow Rate, scfm	0	0	0	0
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Antimony (Sb) Emissions				
ug of sample collected	35.38	40.75	≤ 27.16	≤ 34.43
ppb	3.02	3.25	≤ 2.13	≤ 2.80
ug/dscm	15.31	16.46	≤ 10.81	≤ 14.19
Arsenic (As) Emissions				
ug of sample collected	≤ 20.26	≤ 20.20	≤ 20.36	≤ 20.27
ppb	≤ 2.81	≤ 2.62	≤ 2.60	≤ 2.68
ug/dscm	≤ 8.77	≤ 8.16	≤ 8.10	≤ 8.34
Beryllium (Be) Emissions				
ug of sample collected	≤ 5.05	≤ 5.05	≤ 5.05	≤ 5.05
ppb	≤ 5.83	≤ 5.44	≤ 5.36	≤ 5.54
ug/dscm	≤ 2.19	≤ 2.04	≤ 2.01	≤ 2.08
Cadmium (Cd) Emissions				
ug of sample collected	6.55	≤ 5.00	≤ 5.00	≤ 5.52
ppb	0.61	≤ 0.43	≤ 0.43	≤ 0.49
ug/dscm	2.83	≤ 2.02	≤ 1.99	≤ 2.28
Chromium (Cr) Emissions				
ug of sample collected	4369.73	2839.40	1710.28	2973.14
ppb	874.32	530.05	314.67	573.01
ug/dscm	1891.27	1146.57	680.68	1239.51

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Rotary Dryer Discharge
 Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/7/15	10/7/15	10/7/15	
Start Time	8:20	11:05	13:48	
End Time	10:20	13:05	15:48	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	450.9	411.0	555.8	472.6
Flue Gas Moisture, percent by volume	2.3%	2.2%	2.8%	2.4%
Average Flue Pressure, in. Hg	29.02	29.35	29.35	29.24
Gas Sample Volume, dscf	81.593	87.454	88.732	85.926
Average Gas Velocity, ft/sec	0.000	0.000	0.000	0.000
Gas Volumetric Flow Rate, acfm	0	0	0	0
Gas Volumetric Flow Rate, dscfm	0	0	0	0
Gas Volumetric Flow Rate, scfm	0	0	0	0
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Cobalt (Co) Emissions				
ug of sample collected	740.23	1451.58	906.46	1032.76
ppb	130.67	239.06	147.14	172.29
ug/dscm	320.38	586.16	360.77	422.44
Copper (Cu) Emissions				
ug of sample collected	66316.30	149008.10	481028.10	232117.50
ppb	10855.26	22756.46	72404.71	35338.81
ug/dscm	28702.54	60170.65	191446.27	93439.82
Lead (Pb) Emissions				
ug of sample collected	3221.56	1930.96	2395.56	2516.03
ppb	161.75	90.45	110.60	120.93
ug/dscm	1394.33	779.74	953.42	1042.50
Manganese (Mn) Emissions				
ug of sample collected	8859.20	3589.23	636.44	4361.62
ppb	1677.42	634.05	110.81	807.43
ug/dscm	3834.37	1449.36	253.30	1845.68
Nickel (Ni) Emissions				
ug of sample collected	46604.44	29908.12	21307.49	32606.68
ppb	8257.54	4944.10	3471.62	5557.75
ug/dscm	20171.00	12077.14	8480.25	13576.13

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Rotary Dryer Discharge
 Test Method: 5/29

Source Condition	Normal	Normal	Normal	
Date	10/7/15	10/7/15	10/7/15	
Start Time	8:20	11:05	13:48	
End Time	10:20	13:05	15:48	
	Run 1	Run 2	Run 3	Average
Stack Conditions				
Average Gas Temperature, °F	450.9	411.0	555.8	472.6
Flue Gas Moisture, percent by volume	2.3%	2.2%	2.8%	2.4%
Average Flue Pressure, in. Hg	29.02	29.35	29.35	29.24
Gas Sample Volume, dscf	81.593	87.454	88.732	85.926
Average Gas Velocity, ft/sec	0.000	0.000	0.000	0.000
Gas Volumetric Flow Rate, acfm	0	0	0	0
Gas Volumetric Flow Rate, dscfm	0	0	0	0
Gas Volumetric Flow Rate, scfm	0	0	0	0
Average %CO ₂ by volume, dry basis	0.0	0.0	0.0	0.0
Average %O ₂ by volume, dry basis	20.9	20.9	20.9	20.9
Selenium (Se) Emissions				
ug of sample collected ≤	58.92	≤ 102.50	≤ 51.20	≤ 70.87
ppb ≤	7.76	≤ 12.60	≤ 6.20	≤ 8.85
ug/dscm ≤	25.50	≤ 41.39	≤ 20.38	≤ 29.09
Silver (Ag) Emissions				
ug of sample collected ≤	10.10	≤ 10.10	≤ 18.10	≤ 12.77
ppb ≤	0.97	≤ 0.91	≤ 1.61	≤ 1.16
ug/dscm ≤	4.37	≤ 4.08	≤ 7.20	≤ 5.22
Zinc (Zn) Emissions				
ug of sample collected	103017.70	29219.50	4391.80	45543.00
ppb	16393.39	4338.15	642.65	7124.73
ug/dscm	44587.37	11799.07	1747.91	19378.12
Barium (Ba) Emissions				
ug of sample collected ≤	151.50	≤ 151.50	≤ 153.80	≤ 152.27
ppb ≤	11.48	≤ 10.71	≤ 10.71	≤ 10.97
ug/dscm ≤	65.57	≤ 61.18	≤ 61.21	≤ 62.65

4.0 CERTIFICATION

MOSTARDI PLATT is pleased to have been of service to RK & Associates, Inc. If you have any questions regarding this test report, please do not hesitate to contact us at 630-993-2100.

CERTIFICATION

As project manager, I hereby certify that this test report represents a true and accurate summary of emissions test results and the methodologies employed to obtain those results, and the test program was performed in accordance with the methods specified in this test report.

MOSTARDI PLATT



Mark E. Peterson

Program Manager



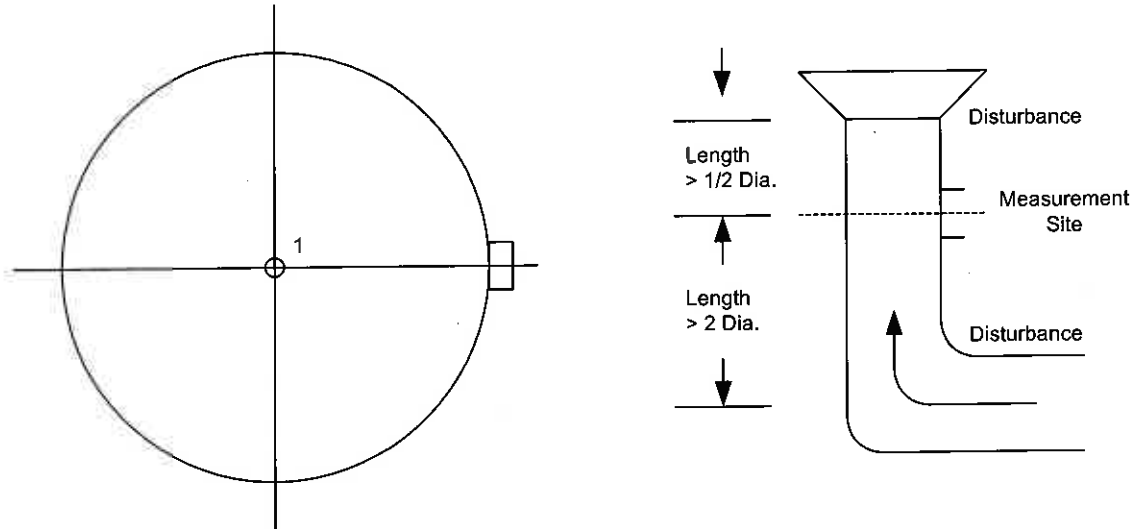
Eric L. Ehlers

Quality Assurance

APPENDICES

Appendix A - Test Section Diagrams

EQUAL AREA TRAVERSE FOR ROUND DUCTS



Job: Behr Iron & Metal

Date: October 7, 2015

Test Location: Thermal Reduction Unit (TPU)

Duct Diameter: 18"

Duct Area: 1.767

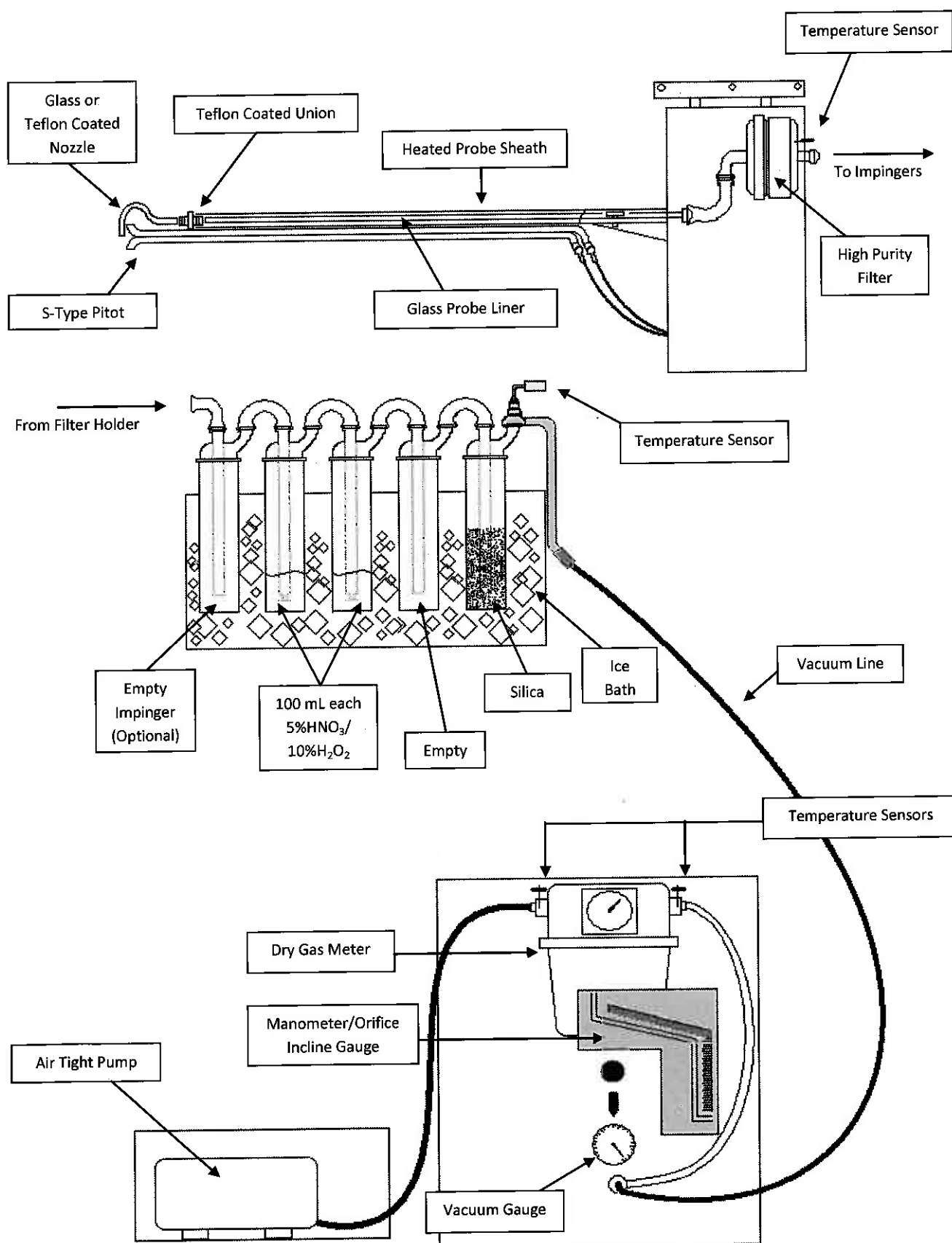
No. Points Across Diameter: 1

No. of Ports: 1

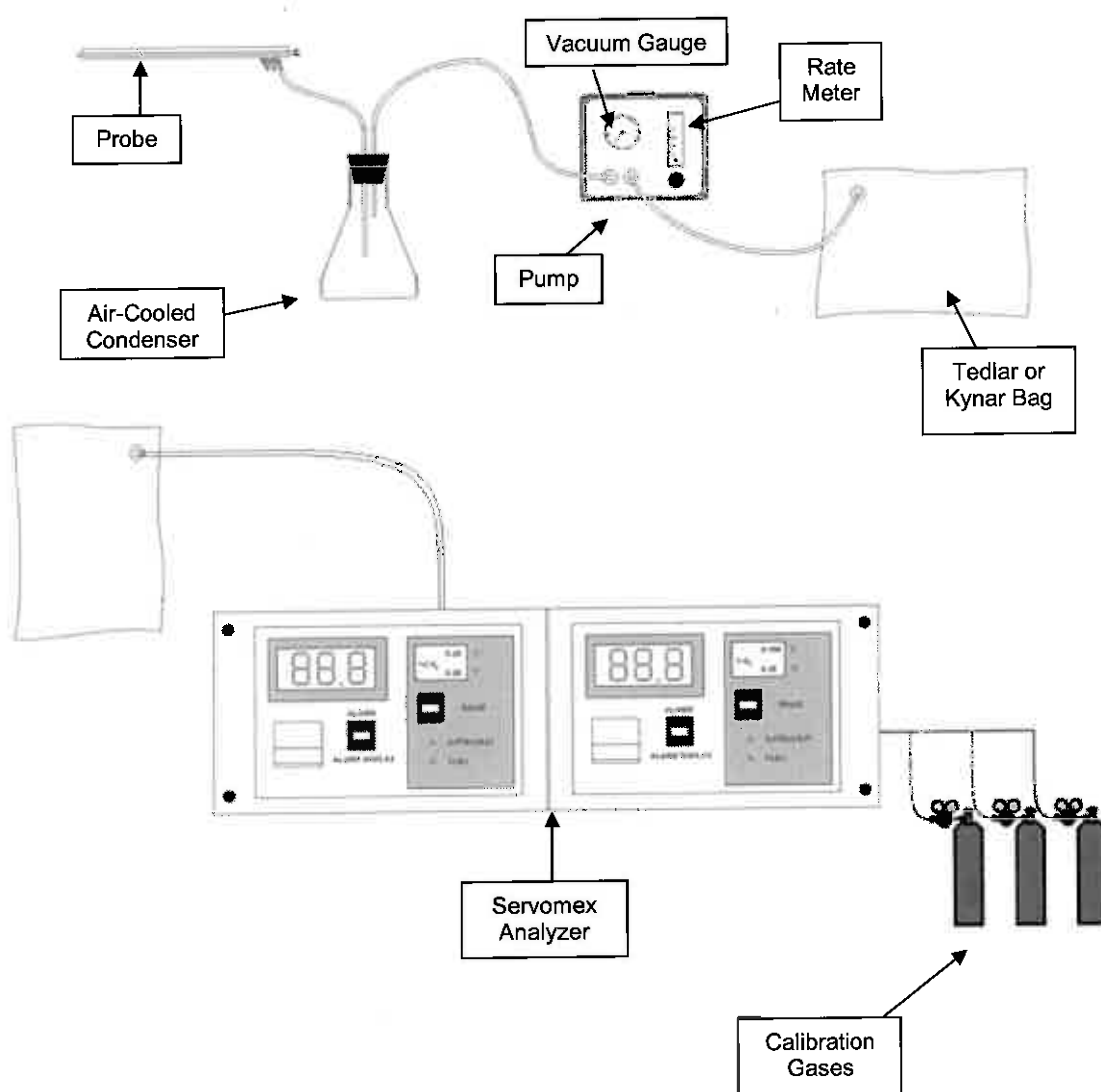
Port Length: 4"

Appendix B - Sample Train Diagrams

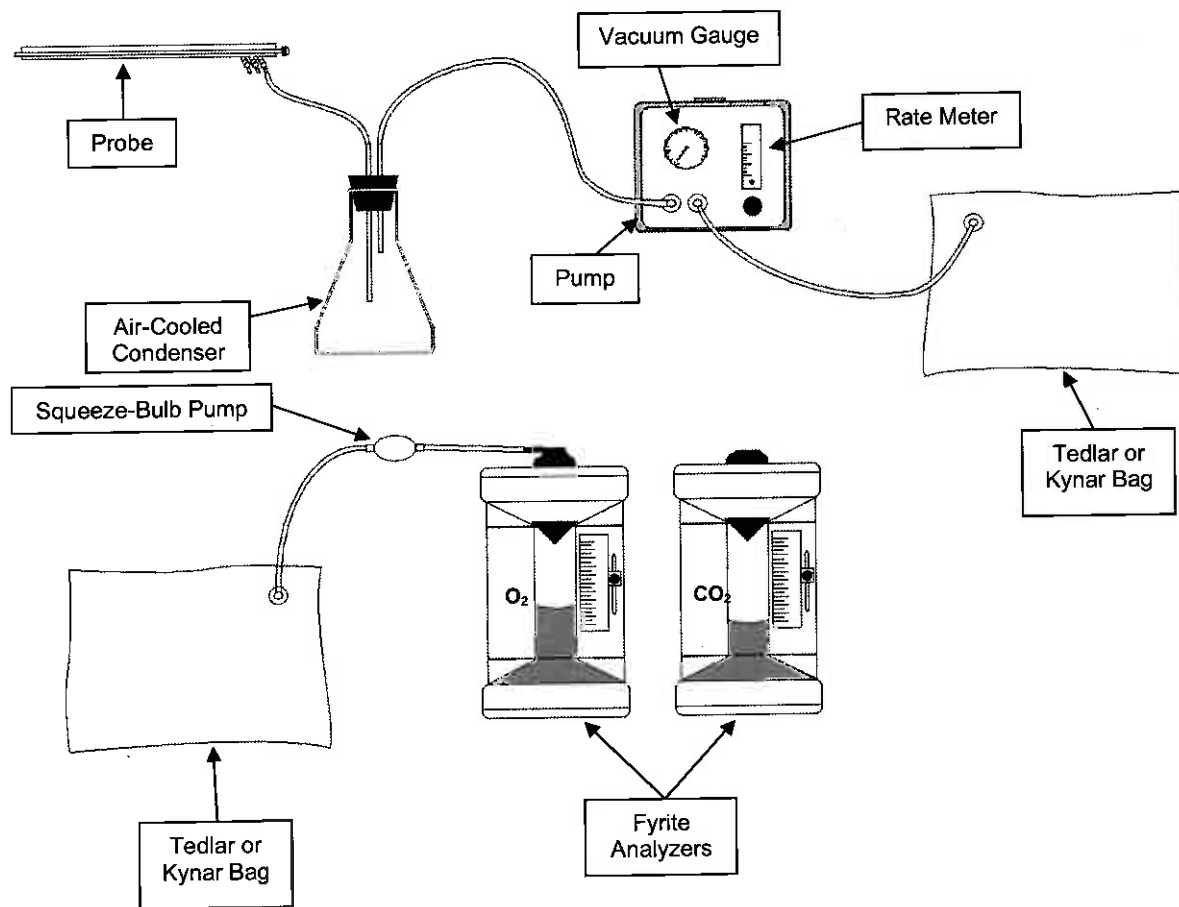
USEPA Method 29- Metals Sample Train Diagram



USEPA Method 3A - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing Tedlar Gas Bag



USEPA Method 3 - Integrated Oxygen/Carbon Dioxide Sample Train Diagram Utilizing Fyrite Gas Analyzer



Appendix C - Calculation Nomenclature and Formulas

Client: RK & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: TPU Baghouse Inlet
 Run: 1
 Date: 10/7/2015
 Method: 5/29
 Source Condition: Normal

Dry Molecular Weight

$$Md = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

$$\%CO_2 = \underline{0.0} \quad \%O_2 = \underline{20.9} \quad \%N_2 = \underline{79.1}$$

$$Md = \underline{28.836}$$

Wet Molecular Weight

$$Ms = Md \times (1 - Bws) + (18.0 \times Bws)$$

$$Md = \underline{28.836} \quad Bws = \underline{0.023}$$

$$Ms = \underline{28.588}$$

Meter Volume at Standard Conditions

$$Vm(std) = 17.647 \times Y \times Vm \times \frac{(Pbar + DH/13.6)}{Tm}$$

$$Y = \underline{1.016} \quad Vm = \underline{81.935} \quad Pbar = \underline{29.39}$$

$$DH = \underline{1.73} \quad Tm = \underline{531.4}$$

$$Vm(std) = \underline{81.593}$$

Volume of Water Vapor Condensed

$$Vw(std) = 0.0471 \times (\text{net } H_2O \text{ gain})$$

$$\text{Net } H_2O = \underline{40.6}$$

$$Vw(std) = \underline{1.912}$$

Moisture Content

$$Bws = \frac{Vwc(std)}{Vwc(std) + Vm(std)}$$

$$Vw(std) = \underline{1.912} \quad Vm(std) = \underline{81.593}$$

$$Bws = \underline{0.023} \quad 0.02181042$$

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: TPU Baghouse Inlet
Run: 1
Date: 10/7/2015
Method: 5/29
Source Condition: Normal

PM Concentration:

This example represents the filterable fraction. For other fractions, use the obtained mn for that particulate fraction.

$$Co = \frac{m_n \times 15.43}{Vm(std)}$$

$$m_n (g) = \underline{0.7500} \quad Vm(std) = \underline{81.593}$$

$$Co = \underline{0.1418} \text{ gr/dscf}$$

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: TPU Baghouse Inlet
 Run: 1
 Date: 10/7/2015
 Method: 5/29
 Source Condition: Normal

Dry Molecular Weight

$$M_d = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

$$\%CO_2 = \underline{0.0} \quad \%O_2 = \underline{20.9} \quad \%N_2 = \underline{79.1}$$

$$M_d = \underline{28.836}$$

Wet Molecular Weight

$$M_s = M_d \times (1 - B_{ws}) + (18.0 \times B_{ws})$$

$$M_d = \underline{28.836} \quad B_{ws} = \underline{0.023}$$

$$M_s = \underline{28.588}$$

Meter Volume at Standard Conditions

$$V_m(\text{std}) = 17.647 \times Y \times V_m \times \frac{(P_{\text{bar}} + DH/13.6)}{T_m}$$

$$Y = \underline{1.016} \quad V_m = \underline{81.935}$$

$$DH = \underline{1.7} \quad T_m = \underline{531.4}$$

$$P_{\text{bar}} = \underline{29.4}$$

$$V_m(\text{std}) = \underline{81.593}$$

Volume of Water Vapor Condensed

$$V_w(\text{std}) = 0.0471 \times (\text{net } H_2O \text{ gain})$$

$$\text{Net } H_2O = \underline{40.6}$$

$$V_w(\text{std}) = \underline{1.912}$$

Moisture Content

$$B_{ws} = \frac{V_{wc}(\text{std})}{V_{wc}(\text{std}) + V_m(\text{std})}$$

$$V_w(\text{std}) = \underline{1.912} \quad V_m(\text{std}) = \underline{81.593}$$

$$B_{ws} = \underline{0.023}$$

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: TPU Baghouse Inlet
Run: 1
Date: 10/7/2015
Method: 5/29
Source Condition: Normal

Antimony (Sb) Concentration:

$$\mu\text{g}/\text{m}^3 = \frac{\mu\text{g of Antimony (Sb)}}{\text{Vm(std)} \times 0.02832 \text{ m}^3/\text{ft}^3}$$

$\mu\text{g} = \underline{35.38} \quad \text{Vm(std)} = \underline{81.593}$

$\mu\text{g}/\text{m}^3 = \underline{15.31}$

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Volumetric Flow Nomenclature

- A = Cross-sectional area of stack or duct, ft²
Bws = Water vapor in gas stream, proportion by volume
Cp = Pitot tube coefficient, dimensionless
Md = Dry molecular weight of gas, lb/lb-mole
Ms = Molecular weight of gas, wet basis, lb/lb-mole
Mw = Molecular weight of water, 18.0 lb/lb-mole
Pbar = Barometric pressure at testing site, in. Hg
Pg = Static pressure of gas, in. Hg (in. H₂O/13.6)
DH = Static pressure of gas, in. H₂O
Ps = Absolute pressure of gas, in. Hg = Pbar + Pg
Pstd = Standard absolute pressure, 29.92 in. Hg
Acfm = Actual volumetric gas flow rate
Scfm = Volumetric gas flow rate, corrected to standard conditions
Dscfm = Standard volumetric flow rate, corrected to dry conditions
R = Ideal gas constant, 21.85 in. Hg-ft³/°R-lb-mole
Ts = Average stack gas temperature, °F
Tm = Average dry gas meter temperature, °F
Tstd = Standard absolute temperature, 528°R
vs = Gas velocity, ft/sec
Vm(std) = Volume of gas sampled, corrected to standard conditions, scf
Vw(std) = Volume of water vapor in gas sample, corrected to standard conditions, scf
Vlc = Volume of liquid collected
Y = Dry gas meter calibration factor
Δp = Velocity head of gas, in. H₂O
K1 = 17.647 °R/in. Hg
%EA = Percent excess air
%CO₂ = Percent carbon dioxide by volume, dry basis
%O₂ = Percent oxygen by volume, dry basis
%N₂ = Percent nitrogen by volume, dry basis
0.264 = Ratio of O₂ to N₂ in air, v/v
0.28 = Molecular weight of N₂ or CO, divided by 100
0.32 = Molecular weight of O₂ divided by 100
0.44 = Molecular weight of CO₂ divided by 100
13.6 = Specific gravity of mercury (Hg)

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Volumetric Air Flow Calculations

$$Vm (std) = 17.647 \times Vm \times \left[\frac{\left(P_{bar} + \left[\frac{DH}{13.6} \right] \right)}{(460 + Tm)} \right] \times Y$$

$$Vw (std) = 0.0471 \times Vlc$$

$$Bws = \left[\frac{Vw (std)}{Vw (std) + Vm (std)} \right]$$

$$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + [0.28 \times (100 - \%CO_2 - \%O_2)]$$

$$Ms = Md \times (1 - Bws) + (18 \times Bws)$$

$$Vs = \sqrt{\frac{(Ts + 460)}{Ms \times Ps}} \times \sqrt{DP} \times Cp \times 85.49$$

$$Acfm = Vs \times Area \text{ (of stack or duct)} \times 60$$

$$Scfm = Acfm \times 17.647 \times \left[\frac{Ps}{(460 + Ts)} \right]$$

$$Scfh = Scfm \times 60 \frac{\text{min}}{\text{hr}}$$

$$Dscfm = Scfm \times (1 - Bws)$$

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Isokinetic Nomenclature

- A = Cross-sectional area of stack or duct, square feet
- A_n = Cross-sectional area of nozzle, square feet
- B_{ws} = Water vapor in gas stream, by volume
- C_a = Acetone blank residue concentration, g/g
- C_{acf} = Concentration of particulate matter in gas stream at actual conditions, gr/acf
- C_p = Pitot tube coefficient
- C_s = Concentration of particulate matter in gas stream, dry basis, corrected to standard conditions, gr/dscf
- IKV = Isokinetic sampling variance, must be $90.0\% \leq IKV \leq 110.0\%$
- M_d = Dry molecular weight of gas, lb/lb-mole
- M_s = Molecular weight of gas, wet basis, lb/lb-mole
- M_w = Molecular weight of water, 18.0 lb/lb-mole
- m_a = Mass of residue of acetone after evaporation, grams
- P_{bar} = Barometric pressure at testing site, inches mercury
- P_q = Static pressure of gas, inches mercury (inches water/13.6)
- P_s = Absolute pressure of gas, inches mercury = $P_{bar} + P_q$
- P_{std} = Standard absolute pressure, 29.92 inches mercury
- Q_{acfm} = Actual volumetric gas flow rate, acfm
- Q_{sd} = Dry volumetric gas flow rate corrected to standard conditions, dscfh
- R = Ideal gas constant, 21.85 inches mercury cubic foot/°R-lb-mole
- T_m = Dry gas meter temperature, °R
- T_s = Gas temperature, °R
- T_{std} = Absolute temperature, 528°R
- V_a = Volume of acetone blank, ml
- V_{aw} = Volume of acetone used in wash, ml
- W_a = Weight of residue in acetone wash, grams
- m_n = Total amount of particulate matter collected, grams
- V_{1c} = Total volume of liquid collected in impingers and silica gel, ml
- V_m = Volume of gas sample as measured by dry gas meter, dcf
- $V_{m(std)}$ = Volume of gas sample measured by dry gas meter, corrected to standard conditions, dscf
- v_s = Gas velocity, ft/sec
- $V_{w(std)}$ = Volume of water vapor in gas sample, corrected to standard conditions, scf
- Y = Dry gas meter calibration factor
- ΔH = Average pressure differential across the orifice meter, inches water
- Δp = Velocity head of gas, inches water
- ρ_a = Density of acetone, 0.7855 g/ml (average)
- ρ_w = Density of water, 0.002201 lb/ml
- θ = Total sampling time, minutes
- K_1 = 17.647 °R/in. Hg
- K_2 = 0.04707 ft³/ml
- K_4 = 0.09450/100 = 0.000945
- K_p = Pitot tube constant, $85.49 \frac{ft}{sec} \left[\frac{(lb/lb-mole)(in. Hg)}{(^{\circ}R)(in. H_2O)} \right]^{1/2}$
- %EA = Percent excess air
- %CO₂ = Percent carbon dioxide by volume, dry basis
- %O₂ = Percent oxygen by volume, dry basis
- %CO = Percent carbon monoxide by volume, dry basis
- %N₂ = Percent nitrogen by volume, dry basis
- 0.264 = Ratio of O₂ to N₂ in air, v/v
- 28 = Molecular weight of N₂ or CO
- 32 = Molecular weight of O₂
- 44 = Molecular weight of CO₂
- 13.6 = Specific gravity of mercury (Hg)

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Isokinetic Calculation Formulas

$$1. V_{w(std)} = V_{lc} \left(\frac{\rho_w}{M_w} \right) \left(\frac{RT_{std}}{P_{std}} \right) = K_2 V_{lc}$$

$$2. V_{m(std)} = V_m Y \left(\frac{T_{std}}{T_m} \right) \left(\frac{P_{bar} + (\frac{\Delta H}{13.6})}{P_{std}} \right) = K_1 V_m Y \frac{(P_{bar} + (\frac{\Delta H}{13.6}))}{T_m}$$

$$3. B_{ws} = \frac{V_{w(std)}}{(V_{m(std)} + V_{w(std)})}$$

$$4. M_d = 0.44(\%CO_2) + 0.32(\%O_2) + 0.28(\%N_2)$$

$$5. M_s = M_d(1 - B_{ws}) + 18.0(B_{ws})$$

$$6. C_a = \frac{m_a}{V_a \rho_a}$$

$$7. W_a = C_a V_{aw} \rho_a$$

$$8. C_{acf} = 15.43 K_i \left(\frac{m_n P_s}{V_{w(std)} + V_{m(std)} T_s} \right)$$

$$9. C_s = (15.43 \text{ grains/gram}) (m_n / V_{m(std)})$$

$$10. v_s = K_p C_p \sqrt{\frac{\Delta P T_s}{P_s M_s}}$$

$$11. Q_{acfm} = v_s A (60 \text{ sec/min})$$

$$12. Q_{sd} = (3600 \text{ sec/hr}) (1 - B_{ws}) v_s \left(\frac{T_{std} P_s}{T_s P_{std}} \right) A$$

$$13. E (\text{emission rate, lbs/hr}) = Q_{std} (C_s / 7000 \text{ grains/lb})$$

$$14. IKV = \frac{T_s V_{m(std)} P_{std}}{T_{std} v_s \theta A_n P_s 60 (1 - B_{ws})} = K_4 \frac{T_s V_{m(std)}}{P_s v_s A_n \theta (1 - B_{ws})}$$

$$15. \%EA = \left(\frac{\%O_2 - (0.5 \%CO)}{0.264 \%N_2 - (\%O_2 - 0.5 \%CO)} \right) \times 100$$

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Trace Metal (Including Mercury) Sample Calculations

Concentration

$$\frac{\mu g}{m^3} = \frac{\mu g \text{ of trace metal}}{dscf \text{ volume sampled} \times 0.02832 \frac{m^3}{ft^3}}$$

Emission Rate

$$\frac{\mu g \text{ of sample} \times \frac{1 \times 10^{-6} \text{ grams}}{\mu g}}{453.6 \text{ gr/lb}} = \text{lbs of trace metal}$$

$$\frac{\text{lbs of trace metal}}{V_m(\text{std})\text{sample}} \times dscfm \times 60 \frac{\text{min}}{\text{hr}} = \text{lbs of trace metal/hr}$$

Appendix D - Laboratory Sample Analysis

Your Project #: M154005
Site Location: ROCKFORD

Attention:Data Reporting

Mostardi Platt
888 Industrial Rd
Elmhurst, IL
USA 60126-1121

Report Date: 2015/10/29
Report #: R3738352
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5L0981

Received: 2015/10/16, 14:00

Sample Matrix: Stack Sampling Train
Samples Received: 27

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals B.H. in H2O2/HNO3 Imp.(6020A)	25	2015/10/27	2015/10/27	BRL SOP-00103 / BRL SOP- EPA M29/CARB 436 m 00102	
Metals F.H. in Filter + Rinses (6020A)	26	2015/10/28	2015/10/28	BRL SOP-00103/ BRL SOP- EPA M29/CARB 436 m 00102	
Metals in Liquid by ICP/MS (6020A)	1	2015/10/27	2015/10/27	BRL SOP-00103	EPA 3010A/6020A m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key



Clayton Johnson

29 Oct 2015 14:40:59 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: CJohnson@maxxam.ca

Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC523		BEC552	BEC552			
Sampling Date				2015/10/06	2015/10/06			
	UNITS	M5/29-BLANK	RDL	M5/29-NW BAGHOUSE-T1	M5/29-NW BAGHOUSE-T1 Lab-Dup	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	<0.40	0.40	37.6	38.1	0.80	4248555	0.080
Front Half Arsenic (As)	ug	<0.40	0.40	33.8	33.5	0.80	4248555	0.080
Front Half Barium (Ba)	ug	5.7	3.0	12.9	12.8	6.0	4248555	0.80
Front Half Beryllium (Be)	ug	<0.10	0.10	<0.20	<0.20	0.20	4248555	0.040
Front Half Cadmium (Cd)	ug	<0.10	0.10	0.91	0.86	0.20	4248555	0.040
Front Half Chromium (Cr)	ug	1.33	0.30	11.0	10.5	0.60	4248555	0.10
Front Half Cobalt (Co)	ug	<0.10	0.10	17.7	17.4	0.20	4248555	0.020
Front Half Copper (Cu)	ug	<2.0	2.0	346	339	4.0	4248555	0.20
Front Half Lead (Pb)	ug	0.94	0.20	795	781	0.40	4248555	0.040
Front Half Manganese (Mn)	ug	1.41	0.75	16.7	16.2	1.5	4248555	0.10
Front Half Nickel (Ni)	ug	<0.50	0.50	71.6	70.6	1.0	4248555	0.20
Front Half Selenium (Se)	ug	<1.0	1.0	<2.0	<2.0	2.0	4248555	0.50
Front Half Silver (Ag)	ug	<0.20	0.20	<0.40	<0.40	0.40	4248555	0.040
Front Half Zinc (Zn)	ug	<5.0	5.0	348	344	10	4248555	1.0
Back Half Antimony (Sb)	ug	<0.20	0.20	<0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	<0.20	0.20	0.57	0.57	0.20	4246778	0.040
Back Half Barium (Ba)	ug	<1.5	1.5	1.8	1.8	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	0.050	<0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	0.128	0.050	0.281	0.279	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	0.62	0.15	1.23	1.23	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	<0.050	0.050	0.272	0.273	0.050	4246778	0.010
Back Half Copper (Cu)	ug	<2.0	2.0	3.6	3.5	2.0	4246778	1.6
Back Half Lead (Pb)	ug	0.50	0.10	3.24	3.29	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	0.61	0.25	0.86	0.86	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	0.49	0.25	0.93	0.94	0.25	4246778	0.060
Back Half Selenium (Se)	ug	<0.50	0.50	<0.50	<0.50	0.50	4246778	0.20
Back Half Silver (Ag)	ug	<0.10	0.10	0.33	0.33	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	<2.5	2.5	9.7	9.8	2.5	4246778	0.60
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
Lab-Dup = Laboratory Initiated Duplicate								

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC553	BEC555		BEC556			
Sampling Date		2015/10/06	2015/10/06		2015/10/06			
	UNITS	M5/29-NW BAGHOUSE-T2	M5/29-NW BAGHOUSE-T3	RDL	M5/29-BAGHOUSE SAND SEPARATOR-T1	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	14.4	13.8	0.80	241	2.0	4248555	0.080
Front Half Arsenic (As)	ug	13.0	11.0	0.80	12.0	2.0	4248555	0.080
Front Half Barium (Ba)	ug	9.6	8.8	6.0	113	15	4248555	0.80
Front Half Beryllium (Be)	ug	<0.20	<0.20	0.20	<0.50	0.50	4248555	0.040
Front Half Cadmium (Cd)	ug	0.47	0.56	0.20	10.7	0.50	4248555	0.040
Front Half Chromium (Cr)	ug	5.98	5.58	0.60	73.9	1.5	4248555	0.10
Front Half Cobalt (Co)	ug	6.74	6.25	0.20	57.7	0.50	4248555	0.020
Front Half Copper (Cu)	ug	183	278	4.0	30600	40	4248555	0.20
Front Half Lead (Pb)	ug	408	469	0.40	20900	4.0	4248555	0.040
Front Half Manganese (Mn)	ug	8.7	10.6	1.5	826	3.8	4248555	0.10
Front Half Nickel (Ni)	ug	29.3	28.7	1.0	332	2.5	4248555	0.20
Front Half Selenium (Se)	ug	<2.0	<2.0	2.0	<5.0	5.0	4248555	0.50
Front Half Silver (Ag)	ug	<0.40	<0.40	0.40	11.8	1.0	4248555	0.040
Front Half Zinc (Zn)	ug	169	171	10	8980	25	4248555	1.0
Back Half Antimony (Sb)	ug	<0.20	<0.20	0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	0.47	0.35	0.20	<0.20	0.20	4246778	0.040
Back Half Barium (Ba)	ug	1.8	<1.5	1.5	2.6	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	1.28	2.36	0.050	0.275	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	1.05	0.91	0.15	1.80	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	0.185	0.363	0.050	0.264	0.050	4246778	0.010
Back Half Copper (Cu)	ug	3.0	6.3	2.0	2.2	2.0	4246778	1.6
Back Half Lead (Pb)	ug	2.97	2.61	0.10	2.66	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	1.06	1.01	0.25	1.61	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	1.17	1.00	0.25	1.29	0.25	4246778	0.060
Back Half Selenium (Se)	ug	<0.50	<0.50	0.50	0.65	0.50	4246778	0.20
Back Half Silver (Ag)	ug	0.13	<0.10	0.10	0.16	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	4.2	3.8	2.5	11.9	2.5	4246778	0.60
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

Maxxam Job #: B5L0981
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Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC557	BEC558		BEC559	BEC560			
Sampling Date		2015/10/06	2015/10/06		2015/10/06	2015/10/06			
	UNITS	M5/29- BAGHOUSE SAND SEPARATOR-T2	M5/29- BAGHOUSE SAND SEPARATOR-T3	RDL	M5/29- BAGHOUSE GAS COOLER-T1	M5/29- BAGHOUSE GAS COOLER-T2	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	219	137	2.0	150	49.2	2.0	4248555	0.080
Front Half Arsenic (As)	ug	11.8	7.3	2.0	18.1	53.4	2.0	4248555	0.080
Front Half Barium (Ba)	ug	109	73	15	57	<15	15	4248555	0.80
Front Half Beryllium (Be)	ug	<0.50	<0.50	0.50	<0.50	<0.50	0.50	4248555	0.040
Front Half Cadmium (Cd)	ug	9.03	7.59	0.50	1.17	1.32	0.50	4248555	0.040
Front Half Chromium (Cr)	ug	53.0	43.4	1.5	47.3	33.7	1.5	4248555	0.10
Front Half Cobalt (Co)	ug	39.8	24.2	0.50	44.6	20.7	0.50	4248555	0.020
Front Half Copper (Cu)	ug	17000	10100	40	1040	225	10	4248555	0.20
Front Half Lead (Pb)	ug	16300	10500	4.0	4270	807	1.0	4248555	0.040
Front Half Manganese (Mn)	ug	582	361	3.8	66.5	18.6	3.8	4248555	0.10
Front Half Nickel (Ni)	ug	229	176	2.5	466	468	2.5	4248555	0.20
Front Half Selenium (Se)	ug	<5.0	<5.0	5.0	<5.0	<5.0	5.0	4248555	0.50
Front Half Silver (Ag)	ug	8.0	9.6	1.0	<1.0	<1.0	1.0	4248555	0.040
Front Half Zinc (Zn)	ug	7740	4910	25	541	137	25	4248555	1.0
Back Half Antimony (Sb)	ug	0.35	<0.20	0.20	<0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	<0.20	<0.20	0.20	1.02	34.0	0.20	4246778	0.040
Back Half Barium (Ba)	ug	2.2	<1.5	1.5	3.1	1.7	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	0.050	<0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	0.539	2.49	0.050	0.471	3.02	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	1.00	0.94	0.15	0.87	1.60	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	0.231	0.179	0.050	0.263	0.351	0.050	4246778	0.010
Back Half Copper (Cu)	ug	2.8	5.3	2.0	4.1	6.9	2.0	4246778	1.6
Back Half Lead (Pb)	ug	4.19	2.28	0.10	3.18	5.11	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	1.21	1.01	0.25	1.13	1.29	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	1.33	0.95	0.25	0.95	2.07	0.25	4246778	0.060
Back Half Selenium (Se)	ug	12.7	<0.50	0.50	0.72	<0.50	0.50	4246778	0.20
Back Half Silver (Ag)	ug	0.12	<0.10	0.10	0.10	<0.10	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	22.4	3.1	2.5	6.9	21.3	2.5	4246778	0.60
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC561	BEC562	BEC565	BEC566	BEC567			
Sampling Date		2015/10/06	2015/10/07	2015/10/07	2015/10/07	2015/10/07			
	UNITS	M5/29-BAGHOUSE GAS COOLER-T3	M5/29-BLUE BAGHOUSE-T1	M5/29-BLUE BAGHOUSE-T2	M5/29-BLUE BAGHOUSE-T3	M5/29-BLUE BAGHOUSE-T4	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	33.0	5.95	1.67	1.46	0.98	0.80	4248555	0.080
Front Half Arsenic (As)	ug	20.5	4.09	1.00	<0.80	<0.80	0.80	4248555	0.080
Front Half Barium (Ba)	ug	17.9	10.5	10.4	10.4	8.0	6.0	4248555	0.80
Front Half Beryllium (Be)	ug	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4248555	0.040
Front Half Cadmium (Cd)	ug	0.48	0.31	1.69	0.91	<0.20	0.20	4248555	0.040
Front Half Chromium (Cr)	ug	20.5	8.30	7.65	6.69	3.85	0.60	4248555	0.10
Front Half Cobalt (Co)	ug	10.9	4.28	2.17	2.12	1.33	0.20	4248555	0.020
Front Half Copper (Cu)	ug	150	263	158	155	81.9	4.0	4248555	0.20
Front Half Lead (Pb)	ug	531	234	55.8	41.2	33.9	0.40	4248555	0.040
Front Half Manganese (Mn)	ug	12.9	22.8	10.6	10.8	6.8	1.5	4248555	0.10
Front Half Nickel (Ni)	ug	202	56.7	60.9	49.4	23.8	1.0	4248555	0.20
Front Half Selenium (Se)	ug	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	4248555	0.50
Front Half Silver (Ag)	ug	<0.40	<0.40	0.42	0.83	1.24	0.40	4248555	0.040
Front Half Zinc (Zn)	ug	107	234	99	91	58	10	4248555	1.0
Back Half Antimony (Sb)	ug	<0.20	0.31	<0.20	<0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	1.37	<0.20	<0.20	<0.20	<0.20	0.20	4246778	0.040
Back Half Barium (Ba)	ug	3.0	1.7	1.6	<1.5	1.8	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	2.81	0.344	0.123	0.315	0.057	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	1.16	1.23	1.43	1.02	2.31	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	0.884	0.593	0.696	0.668	0.522	0.050	4246778	0.010
Back Half Copper (Cu)	ug	7.8	4.6	11.3	3.8	3.4	2.0	4246778	1.6
Back Half Lead (Pb)	ug	7.15	5.31	4.99	4.20	5.55	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	1.13	1.59	1.36	1.09	1.44	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	1.44	1.88	1.52	1.76	3.07	0.25	4246778	0.060
Back Half Selenium (Se)	ug	1.05	2.54	<0.50	0.91	<0.50	0.50	4246778	0.20
Back Half Silver (Ag)	ug	<0.10	0.49	<0.10	<0.10	<0.10	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	3.6	8.8	4.0	4.6	<2.5	2.5	4246778	0.60
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

Maxxam Job #: BSL0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC572	BEC573	BEC574		BEC575			
Sampling Date		2015/10/07	2015/10/07	2015/10/07		2015/10/07			
	UNITS	M5/29-BAGHO USE SWEECO-T1	M5/29-BAGHO USE SWEECO-T2	M5/29-BAGHO USE SWEECO-T3	RDL	M5/29-BAGHO USE SWEECO-T4	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	6.8	8.1	6.5	2.0	8.0	4.0	4248555	0.080
Front Half Arsenic (As)	ug	<2.0	<2.0	<2.0	2.0	<4.0	4.0	4248555	0.080
Front Half Barium (Ba)	ug	63	33	41	15	36	30	4248555	0.80
Front Half Beryllium (Be)	ug	<0.50	<0.50	<0.50	0.50	<1.0	1.0	4248555	0.040
Front Half Cadmium (Cd)	ug	2.96	0.54	0.78	0.50	<1.0	1.0	4248555	0.040
Front Half Chromium (Cr)	ug	10.0	8.4	10.1	1.5	10.4	3.0	4248555	0.10
Front Half Cobalt (Co)	ug	4.28	6.86	6.57	0.50	5.6	1.0	4248555	0.020
Front Half Copper (Cu)	ug	604	2510	2340	10	2180	20	4248555	0.20
Front Half Lead (Pb)	ug	333	607	540	1.0	620	2.0	4248555	0.040
Front Half Manganese (Mn)	ug	29.5	51.1	81.7	3.8	69.1	7.5	4248555	0.10
Front Half Nickel (Ni)	ug	48.8	38.6	59.7	2.5	48.7	5.0	4248555	0.20
Front Half Selenium (Se)	ug	<5.0	<5.0	<5.0	5.0	<10	10	4248555	0.50
Front Half Silver (Ag)	ug	<1.0	1.9	4.1	1.0	7.2	2.0	4248555	0.040
Front Half Zinc (Zn)	ug	530	912	797	25	890	50	4248555	1.0
Back Half Antimony (Sb)	ug	0.31	<0.20	<0.20	0.20	<0.20	0.20	4246778	0.040
Back Half Arsenic (As)	ug	<0.20	<0.20	<0.20	0.20	<0.20	0.20	4246778	0.040
Back Half Barium (Ba)	ug	2.0	2.1	<1.5	1.5	<1.5	1.5	4246778	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	<0.050	0.050	<0.050	0.050	4246778	0.050
Back Half Cadmium (Cd)	ug	0.444	0.255	0.120	0.050	0.332	0.050	4246778	0.030
Back Half Chromium (Cr)	ug	9.43	6.54	7.91	0.15	8.30	0.15	4246778	0.070
Back Half Cobalt (Co)	ug	0.878	0.660	0.339	0.050	1.11	0.050	4246778	0.010
Back Half Copper (Cu)	ug	10.0	19.7	6.0	2.0	18.1	2.0	4246778	1.6
Back Half Lead (Pb)	ug	7.35	7.12	3.90	0.10	8.41	0.10	4246778	0.040
Back Half Manganese (Mn)	ug	3.05	2.42	1.49	0.25	1.80	0.25	4246778	0.060
Back Half Nickel (Ni)	ug	16.5	8.34	5.51	0.25	5.12	0.25	4246778	0.060
Back Half Selenium (Se)	ug	<0.50	<0.50	<0.50	0.50	<0.50	0.50	4246778	0.20
Back Half Silver (Ag)	ug	0.24	0.11	0.16	0.10	<0.10	0.10	4246778	0.020
Back Half Zinc (Zn)	ug	11.9	12.4	3.4	2.5	6.6	2.5	4246778	0.60
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC576	BEC577		BEC578	BEC578			
Sampling Date		2015/10/07	2015/10/07		2015/10/07	2015/10/07			
	UNITS	M5/29-BAGHO USE INLET-T1	M5/29-BAGHO USE INLET-T2	QC Batch	M5/29-BAGHO USE INLET-T3	M5/29- BAGHOUSE INLET-T3 Lab-Dup	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	72.3	9.9	4248555	107	107	2.0	4248561	0.080
Front Half Arsenic (As)	ug	17.6	7.5	4248555	8.1	8.0	2.0	4248561	0.080
Front Half Barium (Ba)	ug	<15	<15	4248555	17	17	15	4248561	0.80
Front Half Beryllium (Be)	ug	<0.50	<0.50	4248555	<0.50	<0.50	0.50	4248561	0.040
Front Half Cadmium (Cd)	ug	1.61	1.17	4248555	2.91	3.05	0.50	4248561	0.040
Front Half Chromium (Cr)	ug	9.2	4.5	4248555	4.7	4.9	1.5	4248561	0.10
Front Half Cobalt (Co)	ug	3.30	1.08	4248555	2.25	2.19	0.50	4248561	0.020
Front Half Copper (Cu)	ug	215	77	4248555	173	174	10	4248561	0.20
Front Half Lead (Pb)	ug	1780	769	4248555	1480	1480	1.0	4248561	0.040
Front Half Manganese (Mn)	ug	12.3	5.2	4248555	7.2	7.2	3.8	4248561	0.10
Front Half Nickel (Ni)	ug	31.7	11.8	4248555	17.7	18.1	2.5	4248561	0.20
Front Half Selenium (Se)	ug	<5.0	<5.0	4248555	<5.0	<5.0	5.0	4248561	0.50
Front Half Silver (Ag)	ug	<1.0	<1.0	4248555	<1.0	<1.0	1.0	4248561	0.040
Front Half Zinc (Zn)	ug	174	58	4248555	99	98	25	4248561	1.0
Back Half Antimony (Sb)	ug	<0.20	0.21	4246778	3.35	3.30	0.20	4246784	0.040
Back Half Arsenic (As)	ug	1.69	0.29	4246778	1.08	1.08	0.20	4246784	0.040
Back Half Barium (Ba)	ug	1.7	3.3	4246778	1.9	1.8	1.5	4246784	0.040
Back Half Beryllium (Be)	ug	<0.050	<0.050	4246778	<0.050	<0.050	0.050	4246784	0.050
Back Half Cadmium (Cd)	ug	0.264	0.260	4246778	0.135	0.123	0.050	4246784	0.030
Back Half Chromium (Cr)	ug	20.9	62.3	4246778	16.1	16.0	0.15	4246784	0.070
Back Half Cobalt (Co)	ug	0.642	1.34	4246778	0.585	0.581	0.050	4246784	0.010
Back Half Copper (Cu)	ug	17.6	18.2	4246778	6.9	6.7	2.0	4246784	1.6
Back Half Lead (Pb)	ug	10.9	13.8	4246778	6.21	6.21	0.10	4246784	0.040
Back Half Manganese (Mn)	ug	1.99	2.10	4246778	2.10	2.06	0.25	4246784	0.060
Back Half Nickel (Ni)	ug	12.9	16.4	4246778	6.66	6.51	0.25	4246784	0.060
Back Half Selenium (Se)	ug	0.55	0.71	4246778	0.53	0.53	0.50	4246784	0.20
Back Half Silver (Ag)	ug	0.11	1.15	4246778	0.24	0.24	0.10	4246784	0.020
Back Half Zinc (Zn)	ug	17.2	10.9	4246778	6.2	5.6	2.5	4246784	0.60
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

EPA M29 METALS (FRONT & BACK SEPARATE)

Maxxam ID		BEC579		BEC580	BEC581		BEC582			
Sampling Date		2015/10/07		2015/10/07	2015/10/07		2015/10/07			
	UNITS	M5/29-BAGHO USE INLET-T4	RDL	M5/29-TPU BAGHOUSE INLET-T1	M5/29-TPU BAGHOUSE INLET-T2	RDL	M5/29-TPU BAGHOUSE INLET-T3	RDL	QC Batch	MDL
Front Half Antimony (Sb)	ug	8.4	2.0	30	39	20	<20	20	4248561	0.080
Front Half Arsenic (As)	ug	4.3	2.0	<20	<20	20	<20	20	4248561	0.080
Front Half Barium (Ba)	ug	<15	15	<150	<150	150	<150	150	4248561	0.80
Front Half Beryllium (Be)	ug	<0.50	0.50	<5.0	<5.0	5.0	<5.0	5.0	4248561	0.040
Front Half Cadmium (Cd)	ug	<0.50	0.50	6.5	<5.0	5.0	<5.0	5.0	4248561	0.040
Front Half Chromium (Cr)	ug	3.2	1.5	4370	2840	15	1710	15	4248561	0.10
Front Half Cobalt (Co)	ug	0.66	0.50	737	1450	5.0	897	5.0	4248561	0.020
Front Half Copper (Cu)	ug	77	10	66300	149000	100	481000 (1)	500	4248561	0.20
Front Half Lead (Pb)	ug	1660	1.0	2930	1850	10	1860	10	4248561	0.040
Front Half Manganese (Mn)	ug	<3.8	3.8	8860	3590	38	635	38	4248561	0.10
Front Half Nickel (Ni)	ug	10.1	2.5	46600	29900	25	21300	25	4248561	0.20
Front Half Selenium (Se)	ug	<5.0	5.0	<50	<50	50	<50	50	4248561	0.50
Front Half Silver (Ag)	ug	<1.0	1.0	<10	<10	10	18	10	4248561	0.040
Front Half Zinc (Zn)	ug	51	25	103000	29200	250	4380	250	4248561	1.0
Back Half Antimony (Sb)	ug	0.37	0.20	5.38	1.75	0.20	7.16	0.20	4246784	0.040
Back Half Arsenic (As)	ug	0.26	0.20	0.26	<0.20	0.20	0.36	0.20	4246784	0.040
Back Half Barium (Ba)	ug	3.3	1.5	<1.5	<1.5	1.5	3.8	1.5	4246784	0.040
Back Half Beryllium (Be)	ug	<0.050	0.050	<0.050	<0.050	0.050	<0.050	0.050	4246784	0.050
Back Half Cadmium (Cd)	ug	0.236	0.050	0.173	0.080	0.050	0.105	0.050	4246784	0.030
Back Half Chromium (Cr)	ug	7.76	0.15	1.68	1.35	0.15	2.23	0.15	4246784	0.070
Back Half Cobalt (Co)	ug	0.683	0.050	3.23	1.58	0.050	9.46	0.050	4246784	0.010
Back Half Copper (Cu)	ug	7.2	2.0	16.3	8.1	2.0	28.1	2.0	4246784	1.6
Back Half Lead (Pb)	ug	7.71	0.10	293	82.4	0.10	537	0.10	4246784	0.040
Back Half Manganese (Mn)	ug	2.03	0.25	1.22	1.25	0.25	3.46	0.25	4246784	0.060
Back Half Nickel (Ni)	ug	4.28	0.25	4.93	8.61	0.25	7.98	0.25	4246784	0.060
Back Half Selenium (Se)	ug	<0.50	0.50	8.92	52.5	0.50	1.20	0.50	4246784	0.20
Back Half Silver (Ag)	ug	0.16	0.10	<0.10	<0.10	0.10	<0.10	0.10	4246784	0.020
Back Half Zinc (Zn)	ug	4.2	2.5	17.7	19.5	2.5	11.8	2.5	4246784	0.60
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
(1) Extra 250x dilution reported										

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

ELEMENTS BY ICP/MS (STACK SAMPLING TRAIN)

Maxxam ID		BEC632	BEC640			
Sampling Date						
	UNITS	AUDIT-0929150-1425	AUDIT-0929150-1426	RDL	QC Batch	MDL
Total Antimony (Sb)	ug/mL	N/A	1.78	0.010	4247327	N/A
Total Arsenic (As)	ug/mL	N/A	0.902	0.010	4247327	N/A
Total Barium (Ba)	ug/mL	N/A	1.10	0.060	4247327	N/A
Total Beryllium (Be)	ug/mL	N/A	1.45	0.0020	4247327	N/A
Total Cadmium (Cd)	ug/mL	N/A	1.17	0.0020	4247327	N/A
Total Chromium (Cr)	ug/mL	N/A	2.51	0.0050	4247327	N/A
Total Cobalt (Co)	ug/mL	N/A	1.96	0.0020	4247327	N/A
Total Copper (Cu)	ug/mL	N/A	1.29	0.010	4247327	N/A
Total Lead (Pb)	ug/mL	N/A	0.719	0.0050	4247327	N/A
Total Manganese (Mn)	ug/mL	N/A	0.343	0.010	4247327	N/A
Total Nickel (Ni)	ug/mL	N/A	0.372	0.010	4247327	N/A
Total Selenium (Se)	ug/mL	N/A	1.81	0.020	4247327	N/A
Total Silver (Ag)	ug/mL	N/A	0.878	0.0050	4247327	N/A
Total Zinc (Zn)	ug/mL	N/A	1.74	0.050	4247327	N/A
Front Half Antimony (Sb)	ug	32.2	N/A	0.40	4248561	0.080
Front Half Arsenic (As)	ug	26.4	N/A	0.40	4248561	0.080
Front Half Barium (Ba)	ug	31.4	N/A	3.0	4248561	0.80
Front Half Beryllium (Be)	ug	12.5	N/A	0.10	4248561	0.040
Front Half Cadmium (Cd)	ug	13.2	N/A	0.10	4248561	0.040
Front Half Chromium (Cr)	ug	21.0	N/A	0.30	4248561	0.10
Front Half Cobalt (Co)	ug	14.6	N/A	0.10	4248561	0.020
Front Half Copper (Cu)	ug	14.2	N/A	2.0	4248561	0.20
Front Half Lead (Pb)	ug	27.4	N/A	0.20	4248561	0.040
Front Half Manganese (Mn)	ug	14.5	N/A	0.75	4248561	0.10
Front Half Nickel (Ni)	ug	27.1	N/A	0.50	4248561	0.20
Front Half Selenium (Se)	ug	26.9	N/A	1.0	4248561	0.50
Front Half Silver (Ag)	ug	40.8	N/A	0.20	4248561	0.040
Front Half Zinc (Zn)	ug	29.0	N/A	5.0	4248561	1.0
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
N/A = Not Applicable						

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC523
Sample ID: M5/29-BLANK
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC552
Sample ID: M5/29-NW BAGHOUSE-T1
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC552 Dup
Sample ID: M5/29-NW BAGHOUSE-T1
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/29	2015/10/28	Nan Raykha

Maxxam ID: BEC553
Sample ID: M5/29-NW BAGHOUSE-T2
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC555
Sample ID: M5/29-NW BAGHOUSE-T3
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC556
Sample ID: M5/29-BAGHOUSE SAND SEPARATOR-T1
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC557
Sample ID: M5/29-BAGHOUSE SAND SEPARATOR-T2
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC558
Sample ID: M5/29-BAGHOUSE SAND SEPARATOR-T3
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC559
Sample ID: M5/29-BAGHOUSE GAS COOLER-T1
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC560
Sample ID: M5/29-BAGHOUSE GAS COOLER-T2
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC561
Sample ID: M5/29-BAGHOUSE GAS COOLER-T3
Matrix: Stack Sampling Train

Collected: 2015/10/06
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC562
Sample ID: M5/29-BLUE BAGHOUSE-T1
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC565
Sample ID: M5/29-BLUE BAGHOUSE-T2
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC566
Sample ID: M5/29-BLUE BAGHOUSE-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC567
Sample ID: M5/29-BLUE BAGHOUSE-T4
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC572
Sample ID: M5/29-BAGHOUSE SWEECO-T1
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC573
Sample ID: M5/29-BAGHOUSE SWEECO-T2
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC574
Sample ID: M5/29-BAGHOUSE SWEECO-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC575
Sample ID: M5/29-BAGHOUSE SWEECO-T4
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC576
Sample ID: M5/29-BAGHOUSE INLET-T1
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC577
Sample ID: M5/29-BAGHOUSE INLET-T2
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246778	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248555	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC578
Sample ID: M5/29-BAGHOUSE INLET-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC578 Dup
Sample ID: M5/29-BAGHOUSE INLET-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC579
Sample ID: M5/29-BAGHOUSE INLET-T4
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

TEST SUMMARY

Maxxam ID: BEC580
Sample ID: M5/29-TPU BAGHOUSE INLET-T1
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC581
Sample ID: M5/29-TPU BAGHOUSE INLET-T2
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC582
Sample ID: M5/29-TPU BAGHOUSE INLET-T3
Matrix: Stack Sampling Train

Collected: 2015/10/07
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4246784	2015/10/27	2015/10/27	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC632
Sample ID: AUDIT-092915O-1425
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4248561	2015/10/28	2015/10/28	Nan Raykha

Maxxam ID: BEC640
Sample ID: AUDIT-092915O-1426
Matrix: Stack Sampling Train

Collected:
Shipped:
Received: 2015/10/16

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Liquid by ICP/MS (6020A)	ICP1/MS	4247327	2015/10/27	2015/10/27	Nan Raykha

GENERAL COMMENTS

Sample BEC556-01 : Extra 20x dilution was reported for Cu and Pb for this sample.

Sample BEC557-01 : Extra 20x dilution was reported for Cu and Pb for this sample.

Sample BEC558-01 : Extra 20x dilution was reported for Cu and Pb for this sample.

EPA M29 METALS (FRONT & BACK SEPARATE)

Metals F.H. in Filter + Rinses (6020A): Extra 2x, 5x or 10x dilution was required for all samples except BEC523, due to the matrix and high levels. Post digestion duplicate and spike were done on sample BEC552.

Trace level Ba was observed in the Processed Blank.

Metals B.H. in H2O2/HNO3 Imp.(6020A): Post digestion duplicate and spike were done on sample BEC552.

Sample digests for BEC560, BEC575 and BEC577 were reanalyzed on 2015-10-28 to confirm data.

Metals F.H. in Filter + Rinses (6020A): Extra 5x or 50x dilution was required for all samples due to the matrix and high levels.

Post digestion duplicate and spike were done on sample BEC578.

Trace level Zn and Ba were observed in the Processed Blank.

Metals B.H. in H2O2/HNO3 Imp.(6020A): Post digestion duplicate and spike were done on sample BEC578.

Sample digests for BEC580 and BEC581 were reanalyzed on 2015-10-28 to confirm data.

ELEMENTS BY ICP/MS (STACK SAMPLING TRAIN)

Metals F.H. in Filter + Rinses (6020A): Extra 5x or 50x dilution was required for all samples due to the matrix and high levels.

Post digestion duplicate and spike were done on sample BEC578.

Trace level Zn and Ba were observed in the Processed Blank.

Results relate only to the items tested.

Maxxam Job #: B5L0981
Report Date: 2015/10/29

Mostardi Platt
Client Project #: M154005
Site Location: ROCKFORD

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4246778	N_R	Matrix Spike(BEC552)		Back Half Antimony (Sb)	2015/10/27		96	%	70 - 130
				Back Half Arsenic (As)	2015/10/27		95	%	70 - 130
				Back Half Barium (Ba)	2015/10/27		99	%	70 - 130
				Back Half Beryllium (Be)	2015/10/27		97	%	70 - 130
				Back Half Cadmium (Cd)	2015/10/27		94	%	70 - 130
				Back Half Chromium (Cr)	2015/10/27		98	%	70 - 130
				Back Half Cobalt (Co)	2015/10/27		98	%	70 - 130
				Back Half Copper (Cu)	2015/10/27		97	%	70 - 130
				Back Half Lead (Pb)	2015/10/27		98	%	70 - 130
				Back Half Manganese (Mn)	2015/10/27		97	%	70 - 130
				Back Half Nickel (Ni)	2015/10/27		98	%	70 - 130
				Back Half Selenium (Se)	2015/10/27		90	%	70 - 130
				Back Half Silver (Ag)	2015/10/27		99	%	70 - 130
				Back Half Zinc (Zn)	2015/10/27		93	%	70 - 130
4246778	N_R	Matrix Spike DUP(BEC552)		Back Half Antimony (Sb)	2015/10/27		96	%	70 - 130
				Back Half Arsenic (As)	2015/10/27		94	%	70 - 130
				Back Half Barium (Ba)	2015/10/27		99	%	70 - 130
				Back Half Beryllium (Be)	2015/10/27		96	%	70 - 130
				Back Half Cadmium (Cd)	2015/10/27		95	%	70 - 130
				Back Half Chromium (Cr)	2015/10/27		99	%	70 - 130
				Back Half Cobalt (Co)	2015/10/27		100	%	70 - 130
				Back Half Copper (Cu)	2015/10/27		98	%	70 - 130
				Back Half Lead (Pb)	2015/10/27		97	%	70 - 130
				Back Half Manganese (Mn)	2015/10/27		98	%	70 - 130
				Back Half Nickel (Ni)	2015/10/27		99	%	70 - 130
				Back Half Selenium (Se)	2015/10/27		91	%	70 - 130
				Back Half Silver (Ag)	2015/10/27		100	%	70 - 130
				Back Half Zinc (Zn)	2015/10/27		92	%	70 - 130
4246778	N_R	MS/MSD RPD		Back Half Antimony (Sb)	2015/10/27	0		%	20
				Back Half Arsenic (As)	2015/10/27	1.1		%	20
				Back Half Barium (Ba)	2015/10/27	0		%	20
				Back Half Beryllium (Be)	2015/10/27	1.0		%	20
				Back Half Cadmium (Cd)	2015/10/27	1.1		%	20
				Back Half Chromium (Cr)	2015/10/27	1.0		%	20
				Back Half Cobalt (Co)	2015/10/27	2.0		%	20
				Back Half Copper (Cu)	2015/10/27	1.0		%	20
				Back Half Lead (Pb)	2015/10/27	1.0		%	20
				Back Half Manganese (Mn)	2015/10/27	1.0		%	20
				Back Half Nickel (Ni)	2015/10/27	1.0		%	20
				Back Half Selenium (Se)	2015/10/27	1.1		%	20
				Back Half Silver (Ag)	2015/10/27	1.0		%	20
				Back Half Zinc (Zn)	2015/10/27	1.1		%	20
4246778	N_R	Spiked Blank		Back Half Antimony (Sb)	2015/10/27		100	%	85 - 115
				Back Half Arsenic (As)	2015/10/27		98	%	85 - 115
				Back Half Barium (Ba)	2015/10/27		100	%	85 - 115
				Back Half Beryllium (Be)	2015/10/27		98	%	85 - 115
				Back Half Cadmium (Cd)	2015/10/27		97	%	85 - 115
				Back Half Chromium (Cr)	2015/10/27		101	%	85 - 115
				Back Half Cobalt (Co)	2015/10/27		102	%	85 - 115
				Back Half Copper (Cu)	2015/10/27		100	%	85 - 115
				Back Half Lead (Pb)	2015/10/27		100	%	85 - 115
				Back Half Manganese (Mn)	2015/10/27		100	%	85 - 115
				Back Half Nickel (Ni)	2015/10/27		101	%	85 - 115

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QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4246778	N_R	Spiked Blank DUP		Back Half Selenium (Se)	2015/10/27		94	%	85 - 115
				Back Half Silver (Ag)	2015/10/27		104	%	85 - 115
				Back Half Zinc (Zn)	2015/10/27		96	%	85 - 115
				Back Half Antimony (Sb)	2015/10/27		101	%	85 - 115
				Back Half Arsenic (As)	2015/10/27		99	%	85 - 115
				Back Half Barium (Ba)	2015/10/27		102	%	85 - 115
				Back Half Beryllium (Be)	2015/10/27		98	%	85 - 115
				Back Half Cadmium (Cd)	2015/10/27		99	%	85 - 115
				Back Half Chromium (Cr)	2015/10/27		102	%	85 - 115
				Back Half Cobalt (Co)	2015/10/27		103	%	85 - 115
				Back Half Copper (Cu)	2015/10/27		101	%	85 - 115
				Back Half Lead (Pb)	2015/10/27		103	%	85 - 115
				Back Half Manganese (Mn)	2015/10/27		101	%	85 - 115
				Back Half Nickel (Ni)	2015/10/27		102	%	85 - 115
				Back Half Selenium (Se)	2015/10/27		93	%	85 - 115
				Back Half Silver (Ag)	2015/10/27		104	%	85 - 115
4246778	N_R	RPD		Back Half Zinc (Zn)	2015/10/27		96	%	85 - 115
				Back Half Antimony (Sb)	2015/10/27	1.3		%	20
				Back Half Arsenic (As)	2015/10/27	0.91		%	20
				Back Half Barium (Ba)	2015/10/27	2.1		%	20
				Back Half Beryllium (Be)	2015/10/27	0.50		%	20
				Back Half Cadmium (Cd)	2015/10/27	1.6		%	20
				Back Half Chromium (Cr)	2015/10/27	1.0		%	20
				Back Half Cobalt (Co)	2015/10/27	0.97		%	20
				Back Half Copper (Cu)	2015/10/27	1.2		%	20
				Back Half Lead (Pb)	2015/10/27	2.6		%	20
				Back Half Manganese (Mn)	2015/10/27	1.2		%	20
				Back Half Nickel (Ni)	2015/10/27	1.4		%	20
				Back Half Selenium (Se)	2015/10/27	0.23		%	20
				Back Half Silver (Ag)	2015/10/27	0.21		%	20
				Back Half Zinc (Zn)	2015/10/27	0.42		%	20
4246778	N_R	Method Blank		Back Half Antimony (Sb)	2015/10/27	<0.20		ug	
				Back Half Arsenic (As)	2015/10/27	<0.20		ug	
				Back Half Barium (Ba)	2015/10/27	<1.5		ug	
				Back Half Beryllium (Be)	2015/10/27	<0.050		ug	
				Back Half Cadmium (Cd)	2015/10/27	<0.050		ug	
				Back Half Chromium (Cr)	2015/10/27	<0.15		ug	
				Back Half Cobalt (Co)	2015/10/27	<0.050		ug	
				Back Half Copper (Cu)	2015/10/27	<2.0		ug	
				Back Half Lead (Pb)	2015/10/27	<0.10		ug	
				Back Half Manganese (Mn)	2015/10/27	<0.25		ug	
				Back Half Nickel (Ni)	2015/10/27	<0.25		ug	
				Back Half Selenium (Se)	2015/10/27	<0.50		ug	
				Back Half Silver (Ag)	2015/10/27	<0.10		ug	
				Back Half Zinc (Zn)	2015/10/27	<2.5		ug	
4246778	N_R	RPD - Sample/Sample Dup		Back Half Antimony (Sb)	2015/10/27	NC		%	20
				Back Half Arsenic (As)	2015/10/27	NC		%	20
				Back Half Barium (Ba)	2015/10/27	NC		%	20
				Back Half Beryllium (Be)	2015/10/27	NC		%	20
				Back Half Cadmium (Cd)	2015/10/27	0.54		%	20
				Back Half Chromium (Cr)	2015/10/27	0		%	20
				Back Half Cobalt (Co)	2015/10/27	0.55		%	20
				Back Half Copper (Cu)	2015/10/27	NC		%	20

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QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
				Back Half Lead (Pb)	2015/10/27	1.5		%	20
				Back Half Manganese (Mn)	2015/10/27	NC		%	20
				Back Half Nickel (Ni)	2015/10/27	NC		%	20
				Back Half Selenium (Se)	2015/10/27	NC		%	20
				Back Half Silver (Ag)	2015/10/27	NC		%	20
				Back Half Zinc (Zn)	2015/10/27	NC		%	20
4246784	N_R		Matrix Spike(BECS78)	Back Half Antimony (Sb)	2015/10/27		94	%	70 - 130
				Back Half Arsenic (As)	2015/10/27		90	%	70 - 130
				Back Half Barium (Ba)	2015/10/27		98	%	70 - 130
				Back Half Beryllium (Be)	2015/10/27		90	%	70 - 130
				Back Half Cadmium (Cd)	2015/10/27		91	%	70 - 130
				Back Half Chromium (Cr)	2015/10/27		97	%	70 - 130
				Back Half Cobalt (Co)	2015/10/27		98	%	70 - 130
				Back Half Copper (Cu)	2015/10/27		96	%	70 - 130
				Back Half Lead (Pb)	2015/10/27		96	%	70 - 130
				Back Half Manganese (Mn)	2015/10/27		95	%	70 - 130
				Back Half Nickel (Ni)	2015/10/27		97	%	70 - 130
				Back Half Selenium (Se)	2015/10/27		84	%	70 - 130
				Back Half Silver (Ag)	2015/10/27		97	%	70 - 130
				Back Half Zinc (Zn)	2015/10/27		86	%	70 - 130
4246784	N_R		Matrix Spike DUP(BECS78)	Back Half Antimony (Sb)	2015/10/27		94	%	70 - 130
				Back Half Arsenic (As)	2015/10/27		92	%	70 - 130
				Back Half Barium (Ba)	2015/10/27		99	%	70 - 130
				Back Half Beryllium (Be)	2015/10/27		90	%	70 - 130
				Back Half Cadmium (Cd)	2015/10/27		92	%	70 - 130
				Back Half Chromium (Cr)	2015/10/27		99	%	70 - 130
				Back Half Cobalt (Co)	2015/10/27		100	%	70 - 130
				Back Half Copper (Cu)	2015/10/27		98	%	70 - 130
				Back Half Lead (Pb)	2015/10/27		96	%	70 - 130
				Back Half Manganese (Mn)	2015/10/27		97	%	70 - 130
				Back Half Nickel (Ni)	2015/10/27		99	%	70 - 130
				Back Half Selenium (Se)	2015/10/27		86	%	70 - 130
				Back Half Silver (Ag)	2015/10/27		97	%	70 - 130
				Back Half Zinc (Zn)	2015/10/27		86	%	70 - 130
4246784	N_R		MS/MSD RPD	Back Half Antimony (Sb)	2015/10/27	0		%	20
				Back Half Arsenic (As)	2015/10/27	2.2		%	20
				Back Half Barium (Ba)	2015/10/27	1.0		%	20
				Back Half Beryllium (Be)	2015/10/27	0		%	20
				Back Half Cadmium (Cd)	2015/10/27	1.1		%	20
				Back Half Chromium (Cr)	2015/10/27	2.0		%	20
				Back Half Cobalt (Co)	2015/10/27	2.0		%	20
				Back Half Copper (Cu)	2015/10/27	2.1		%	20
				Back Half Lead (Pb)	2015/10/27	0		%	20
				Back Half Manganese (Mn)	2015/10/27	2.1		%	20
				Back Half Nickel (Ni)	2015/10/27	2.0		%	20
				Back Half Selenium (Se)	2015/10/27	2.4		%	20
				Back Half Silver (Ag)	2015/10/27	0		%	20
				Back Half Zinc (Zn)	2015/10/27	0		%	20
4246784	N_R		Spiked Blank	Back Half Antimony (Sb)	2015/10/27		98	%	85 - 115
				Back Half Arsenic (As)	2015/10/27		97	%	85 - 115
				Back Half Barium (Ba)	2015/10/27		100	%	85 - 115
				Back Half Beryllium (Be)	2015/10/27		97	%	85 - 115
				Back Half Cadmium (Cd)	2015/10/27		96	%	85 - 115

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QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
				Back Half Chromium (Cr)	2015/10/27		100	%	85 - 115
				Back Half Cobalt (Co)	2015/10/27		102	%	85 - 115
				Back Half Copper (Cu)	2015/10/27		100	%	85 - 115
				Back Half Lead (Pb)	2015/10/27		99	%	85 - 115
				Back Half Manganese (Mn)	2015/10/27		98	%	85 - 115
				Back Half Nickel (Ni)	2015/10/27		100	%	85 - 115
				Back Half Selenium (Se)	2015/10/27		92	%	85 - 115
				Back Half Silver (Ag)	2015/10/27		103	%	85 - 115
				Back Half Zinc (Zn)	2015/10/27		94	%	85 - 115
4246784	N_R		Spiked Blank DUP	Back Half Antimony (Sb)	2015/10/27		99	%	85 - 115
				Back Half Arsenic (As)	2015/10/27		99	%	85 - 115
				Back Half Barium (Ba)	2015/10/27		100	%	85 - 115
				Back Half Beryllium (Be)	2015/10/27		99	%	85 - 115
				Back Half Cadmium (Cd)	2015/10/27		98	%	85 - 115
				Back Half Chromium (Cr)	2015/10/27		101	%	85 - 115
				Back Half Cobalt (Co)	2015/10/27		103	%	85 - 115
				Back Half Copper (Cu)	2015/10/27		101	%	85 - 115
				Back Half Lead (Pb)	2015/10/27		102	%	85 - 115
				Back Half Manganese (Mn)	2015/10/27		100	%	85 - 115
				Back Half Nickel (Ni)	2015/10/27		102	%	85 - 115
				Back Half Selenium (Se)	2015/10/27		94	%	85 - 115
				Back Half Silver (Ag)	2015/10/27		102	%	85 - 115
				Back Half Zinc (Zn)	2015/10/27		96	%	85 - 115
4246784	N_R		RPD	Back Half Antimony (Sb)	2015/10/27	0.89		%	20
				Back Half Arsenic (As)	2015/10/27	1.6		%	20
				Back Half Barium (Ba)	2015/10/27	0.74		%	20
				Back Half Beryllium (Be)	2015/10/27	2.1		%	20
				Back Half Cadmium (Cd)	2015/10/27	2.2		%	20
				Back Half Chromium (Cr)	2015/10/27	1.2		%	20
				Back Half Cobalt (Co)	2015/10/27	1.2		%	20
				Back Half Copper (Cu)	2015/10/27	1.1		%	20
				Back Half Lead (Pb)	2015/10/27	3.5		%	20
				Back Half Manganese (Mn)	2015/10/27	2.1		%	20
				Back Half Nickel (Ni)	2015/10/27	1.9		%	20
				Back Half Selenium (Se)	2015/10/27	2.4		%	20
				Back Half Silver (Ag)	2015/10/27	1.2		%	20
				Back Half Zinc (Zn)	2015/10/27	1.6		%	20
4246784	N_R		Method Blank	Back Half Antimony (Sb)	2015/10/27	<0.20		ug	
				Back Half Arsenic (As)	2015/10/27	<0.20		ug	
				Back Half Barium (Ba)	2015/10/27	<1.5		ug	
				Back Half Beryllium (Be)	2015/10/27	<0.050		ug	
				Back Half Cadmium (Cd)	2015/10/27	<0.050		ug	
				Back Half Chromium (Cr)	2015/10/27	<0.15		ug	
				Back Half Cobalt (Co)	2015/10/27	<0.050		ug	
				Back Half Copper (Cu)	2015/10/27	<2.0		ug	
				Back Half Lead (Pb)	2015/10/27	<0.10		ug	
				Back Half Manganese (Mn)	2015/10/27	<0.25		ug	
				Back Half Nickel (Ni)	2015/10/27	<0.25		ug	
				Back Half Selenium (Se)	2015/10/27	<0.50		ug	
				Back Half Silver (Ag)	2015/10/27	<0.10		ug	
				Back Half Zinc (Zn)	2015/10/27	<2.5		ug	
4246784	N_R		RPD - Sample/Sample Dup	Back Half Antimony (Sb)	2015/10/27	1.4		%	20
				Back Half Arsenic (As)	2015/10/27	0.56		%	20

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QA/QC			Date		%		UNITS	QC Limits
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery		
4247327	N_R	Spiked Blank	Back Half Barium (Ba)	2015/10/27	NC		%	20
			Back Half Beryllium (Be)	2015/10/27	NC		%	20
			Back Half Cadmium (Cd)	2015/10/27	NC		%	20
			Back Half Chromium (Cr)	2015/10/27	0.78		%	20
			Back Half Cobalt (Co)	2015/10/27	0.77		%	20
			Back Half Copper (Cu)	2015/10/27	NC		%	20
			Back Half Lead (Pb)	2015/10/27	0.12		%	20
			Back Half Manganese (Mn)	2015/10/27	1.7		%	20
			Back Half Nickel (Ni)	2015/10/27	2.4		%	20
			Back Half Selenium (Se)	2015/10/27	NC		%	20
			Back Half Silver (Ag)	2015/10/27	NC		%	20
			Back Half Zinc (Zn)	2015/10/27	NC		%	20
			Total Antimony (Sb)	2015/10/27		98	%	85 - 115
			Total Arsenic (As)	2015/10/27		97	%	85 - 115
			Total Barium (Ba)	2015/10/27		100	%	85 - 115
4247327	N_R	Spiked Blank DUP	Total Beryllium (Be)	2015/10/27		97	%	85 - 115
			Total Cadmium (Cd)	2015/10/27		96	%	85 - 115
			Total Chromium (Cr)	2015/10/27		100	%	85 - 115
			Total Cobalt (Co)	2015/10/27		102	%	85 - 115
			Total Copper (Cu)	2015/10/27		100	%	85 - 115
			Total Lead (Pb)	2015/10/27		99	%	85 - 115
			Total Manganese (Mn)	2015/10/27		98	%	85 - 115
			Total Nickel (Ni)	2015/10/27		100	%	85 - 115
			Total Selenium (Se)	2015/10/27		92	%	85 - 115
			Total Silver (Ag)	2015/10/27		103	%	85 - 115
			Total Zinc (Zn)	2015/10/27		94	%	85 - 115
			Total Antimony (Sb)	2015/10/27		99	%	85 - 115
			Total Arsenic (As)	2015/10/27		99	%	85 - 115
			Total Barium (Ba)	2015/10/27		100	%	85 - 115
			Total Beryllium (Be)	2015/10/27		99	%	85 - 115
4247327	N_R	RPD	Total Cadmium (Cd)	2015/10/27		98	%	85 - 115
			Total Chromium (Cr)	2015/10/27		101	%	85 - 115
			Total Cobalt (Co)	2015/10/27		103	%	85 - 115
			Total Copper (Cu)	2015/10/27		101	%	85 - 115
			Total Lead (Pb)	2015/10/27		102	%	85 - 115
			Total Manganese (Mn)	2015/10/27		100	%	85 - 115
			Total Nickel (Ni)	2015/10/27		102	%	85 - 115
			Total Selenium (Se)	2015/10/27		94	%	85 - 115
			Total Silver (Ag)	2015/10/27		102	%	85 - 115
			Total Zinc (Zn)	2015/10/27		96	%	85 - 115
			Total Antimony (Sb)	2015/10/27	0.89		%	20
			Total Arsenic (As)	2015/10/27	1.6		%	20
			Total Barium (Ba)	2015/10/27	0.74		%	20
			Total Beryllium (Be)	2015/10/27	2.1		%	20
			Total Cadmium (Cd)	2015/10/27	2.2		%	20
			Total Chromium (Cr)	2015/10/27	1.2		%	20
			Total Cobalt (Co)	2015/10/27	1.2		%	20
			Total Copper (Cu)	2015/10/27	1.1		%	20
			Total Lead (Pb)	2015/10/27	3.5		%	20
			Total Manganese (Mn)	2015/10/27	2.1		%	20
			Total Nickel (Ni)	2015/10/27	1.9		%	20
			Total Selenium (Se)	2015/10/27	2.4		%	20
			Total Silver (Ag)	2015/10/27	1.2		%	20

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4247327	N_R	Method Blank	Total Zinc (Zn)	2015/10/27	1.6		%	20
			Total Antimony (Sb)	2015/10/27	<0.010		ug/mL	
			Total Arsenic (As)	2015/10/27	<0.010		ug/mL	
			Total Barium (Ba)	2015/10/27	<0.060		ug/mL	
			Total Beryllium (Be)	2015/10/27	<0.0020		ug/mL	
			Total Cadmium (Cd)	2015/10/27	<0.0020		ug/mL	
			Total Chromium (Cr)	2015/10/27	<0.0050		ug/mL	
			Total Cobalt (Co)	2015/10/27	<0.0020		ug/mL	
			Total Copper (Cu)	2015/10/27	<0.010		ug/mL	
			Total Lead (Pb)	2015/10/27	<0.0050		ug/mL	
			Total Manganese (Mn)	2015/10/27	<0.010		ug/mL	
			Total Nickel (Ni)	2015/10/27	<0.010		ug/mL	
			Total Selenium (Se)	2015/10/27	<0.020		ug/mL	
			Total Silver (Ag)	2015/10/27	<0.0050		ug/mL	
			Total Zinc (Zn)	2015/10/27	<0.050		ug/mL	
4248555	N_R	Matrix Spike(BEC552)	Front Half Antimony (Sb)	2015/10/28		103	%	70 - 130
			Front Half Arsenic (As)	2015/10/28		96	%	70 - 130
			Front Half Barium (Ba)	2015/10/28		101	%	70 - 130
			Front Half Beryllium (Be)	2015/10/28		96	%	70 - 130
			Front Half Cadmium (Cd)	2015/10/28		100	%	70 - 130
			Front Half Chromium (Cr)	2015/10/28		96	%	70 - 130
			Front Half Cobalt (Co)	2015/10/28		98	%	70 - 130
			Front Half Copper (Cu)	2015/10/28		95	%	70 - 130
			Front Half Lead (Pb)	2015/10/28		94	%	70 - 130
			Front Half Manganese (Mn)	2015/10/28		98	%	70 - 130
			Front Half Nickel (Ni)	2015/10/28		95	%	70 - 130
			Front Half Selenium (Se)	2015/10/28		98	%	70 - 130
			Front Half Silver (Ag)	2015/10/28		100	%	70 - 130
			Front Half Zinc (Zn)	2015/10/28		101	%	70 - 130
4248555	N_R	Matrix Spike DUP(BEC552)	Front Half Antimony (Sb)	2015/10/28		107	%	70 - 130
			Front Half Arsenic (As)	2015/10/28		98	%	70 - 130
			Front Half Barium (Ba)	2015/10/28		102	%	70 - 130
			Front Half Beryllium (Be)	2015/10/28		95	%	70 - 130
			Front Half Cadmium (Cd)	2015/10/28		103	%	70 - 130
			Front Half Chromium (Cr)	2015/10/28		98	%	70 - 130
			Front Half Cobalt (Co)	2015/10/28		100	%	70 - 130
			Front Half Copper (Cu)	2015/10/28		96	%	70 - 130
			Front Half Lead (Pb)	2015/10/28		96	%	70 - 130
			Front Half Manganese (Mn)	2015/10/28		99	%	70 - 130
			Front Half Nickel (Ni)	2015/10/28		98	%	70 - 130
			Front Half Selenium (Se)	2015/10/28		99	%	70 - 130
			Front Half Silver (Ag)	2015/10/28		102	%	70 - 130
			Front Half Zinc (Zn)	2015/10/28		103	%	70 - 130
4248555	N_R	MS/MSD RPD	Front Half Antimony (Sb)	2015/10/28	3.8		%	20
			Front Half Arsenic (As)	2015/10/28	2.1		%	20
			Front Half Barium (Ba)	2015/10/28	0.99		%	20
			Front Half Beryllium (Be)	2015/10/28	1.0		%	20
			Front Half Cadmium (Cd)	2015/10/28	3.0		%	20
			Front Half Chromium (Cr)	2015/10/28	2.1		%	20
			Front Half Cobalt (Co)	2015/10/28	2.0		%	20
			Front Half Copper (Cu)	2015/10/28	1.0		%	20
			Front Half Lead (Pb)	2015/10/28	2.1		%	20
			Front Half Manganese (Mn)	2015/10/28	1.0		%	20

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Mostardi Platt
Client Project #: M154005
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4248555	N_R	Spiked Blank	Front Half Nickel (Ni)	2015/10/28	3.1		%	20
			Front Half Selenium (Se)	2015/10/28	1.0		%	20
			Front Half Silver (Ag)	2015/10/28	2.0		%	20
			Front Half Zinc (Zn)	2015/10/28	2.0		%	20
			Front Half Antimony (Sb)	2015/10/28		98	%	85 - 115
			Front Half Arsenic (As)	2015/10/28		99	%	85 - 115
			Front Half Barium (Ba)	2015/10/28		97	%	85 - 115
			Front Half Beryllium (Be)	2015/10/28		102	%	85 - 115
			Front Half Cadmium (Cd)	2015/10/28		97	%	85 - 115
			Front Half Chromium (Cr)	2015/10/28		101	%	85 - 115
			Front Half Cobalt (Co)	2015/10/28		104	%	85 - 115
			Front Half Copper (Cu)	2015/10/28		101	%	85 - 115
			Front Half Lead (Pb)	2015/10/28		102	%	85 - 115
			Front Half Manganese (Mn)	2015/10/28		102	%	85 - 115
			Front Half Nickel (Ni)	2015/10/28		102	%	85 - 115
			Front Half Selenium (Se)	2015/10/28		99	%	85 - 115
4248555	N_R	Spiked Blank DUP	Front Half Silver (Ag)	2015/10/28		103	%	85 - 115
			Front Half Zinc (Zn)	2015/10/28		104	%	85 - 115
			Front Half Antimony (Sb)	2015/10/28		99	%	85 - 115
			Front Half Arsenic (As)	2015/10/28		100	%	85 - 115
			Front Half Barium (Ba)	2015/10/28		97	%	85 - 115
			Front Half Beryllium (Be)	2015/10/28		100	%	85 - 115
			Front Half Cadmium (Cd)	2015/10/28		97	%	85 - 115
			Front Half Chromium (Cr)	2015/10/28		100	%	85 - 115
			Front Half Cobalt (Co)	2015/10/28		104	%	85 - 115
			Front Half Copper (Cu)	2015/10/28		101	%	85 - 115
			Front Half Lead (Pb)	2015/10/28		100	%	85 - 115
			Front Half Manganese (Mn)	2015/10/28		101	%	85 - 115
			Front Half Nickel (Ni)	2015/10/28		101	%	85 - 115
			Front Half Selenium (Se)	2015/10/28		98	%	85 - 115
			Front Half Silver (Ag)	2015/10/28		102	%	85 - 115
			Front Half Zinc (Zn)	2015/10/28		104	%	85 - 115
4248555	N_R	RPD	Front Half Antimony (Sb)	2015/10/28	0.70		%	20
			Front Half Arsenic (As)	2015/10/28	0.42		%	20
			Front Half Barium (Ba)	2015/10/28	0.054		%	20
			Front Half Beryllium (Be)	2015/10/28	1.9		%	20
			Front Half Cadmium (Cd)	2015/10/28	0.28		%	20
			Front Half Chromium (Cr)	2015/10/28	0.39		%	20
			Front Half Cobalt (Co)	2015/10/28	0.76		%	20
			Front Half Copper (Cu)	2015/10/28	0.036		%	20
			Front Half Lead (Pb)	2015/10/28	2.0		%	20
			Front Half Manganese (Mn)	2015/10/28	1.5		%	20
			Front Half Nickel (Ni)	2015/10/28	0.79		%	20
			Front Half Selenium (Se)	2015/10/28	0.45		%	20
			Front Half Silver (Ag)	2015/10/28	1.1		%	20
			Front Half Zinc (Zn)	2015/10/28	0.21		%	20
			Front Half Antimony (Sb)	2015/10/28	<0.40		ug	
			Front Half Arsenic (As)	2015/10/28	<0.40		ug	
4248555	N_R	Method Blank	Front Half Barium (Ba)	2015/10/28	3.5		ug	
					RDL=3.0			
			Front Half Beryllium (Be)	2015/10/28	<0.10		ug	
			Front Half Cadmium (Cd)	2015/10/28	<0.10		ug	
			Front Half Chromium (Cr)	2015/10/28	<0.30		ug	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Front Half Cobalt (Co)	2015/10/28	<0.10		ug	
			Front Half Copper (Cu)	2015/10/28	<2.0		ug	
			Front Half Lead (Pb)	2015/10/28	<0.20		ug	
			Front Half Manganese (Mn)	2015/10/28	<0.75		ug	
			Front Half Nickel (Ni)	2015/10/28	<0.50		ug	
			Front Half Selenium (Se)	2015/10/28	<1.0		ug	
			Front Half Silver (Ag)	2015/10/28	<0.20		ug	
			Front Half Zinc (Zn)	2015/10/28	<5.0		ug	
4248555	N_R	RPD - Sample/Sample Dup	Front Half Antimony (Sb)	2015/10/28	1.2		%	20
			Front Half Arsenic (As)	2015/10/28	0.91		%	20
			Front Half Barium (Ba)	2015/10/28	NC		%	20
			Front Half Beryllium (Be)	2015/10/28	NC		%	20
			Front Half Cadmium (Cd)	2015/10/28	NC		%	20
			Front Half Chromium (Cr)	2015/10/28	5.0		%	20
			Front Half Cobalt (Co)	2015/10/28	1.7		%	20
			Front Half Copper (Cu)	2015/10/28	2.0		%	20
			Front Half Lead (Pb)	2015/10/28	1.8		%	20
			Front Half Manganese (Mn)	2015/10/28	3.2		%	20
			Front Half Nickel (Ni)	2015/10/28	1.4		%	20
			Front Half Selenium (Se)	2015/10/28	NC		%	20
			Front Half Silver (Ag)	2015/10/28	NC		%	20
			Front Half Zinc (Zn)	2015/10/28	1.2		%	20
4248561	N_R	Matrix Spike(BEC578)	Front Half Antimony (Sb)	2015/10/28		100	%	70 - 130
			Front Half Arsenic (As)	2015/10/28		97	%	70 - 130
			Front Half Barium (Ba)	2015/10/28		100	%	70 - 130
			Front Half Beryllium (Be)	2015/10/28		96	%	70 - 130
			Front Half Cadmium (Cd)	2015/10/28		98	%	70 - 130
			Front Half Chromium (Cr)	2015/10/28		99	%	70 - 130
			Front Half Cobalt (Co)	2015/10/28		100	%	70 - 130
			Front Half Copper (Cu)	2015/10/28		99	%	70 - 130
			Front Half Lead (Pb)	2015/10/28		99	%	70 - 130
			Front Half Manganese (Mn)	2015/10/28		100	%	70 - 130
			Front Half Nickel (Ni)	2015/10/28		98	%	70 - 130
			Front Half Selenium (Se)	2015/10/28		98	%	70 - 130
			Front Half Silver (Ag)	2015/10/28		98	%	70 - 130
			Front Half Zinc (Zn)	2015/10/28		102	%	70 - 130
4248561	N_R	Matrix Spike DUP(BEC578)	Front Half Antimony (Sb)	2015/10/28		99	%	70 - 130
			Front Half Arsenic (As)	2015/10/28		98	%	70 - 130
			Front Half Barium (Ba)	2015/10/28		100	%	70 - 130
			Front Half Beryllium (Be)	2015/10/28		97	%	70 - 130
			Front Half Cadmium (Cd)	2015/10/28		97	%	70 - 130
			Front Half Chromium (Cr)	2015/10/28		100	%	70 - 130
			Front Half Cobalt (Co)	2015/10/28		101	%	70 - 130
			Front Half Copper (Cu)	2015/10/28		99	%	70 - 130
			Front Half Lead (Pb)	2015/10/28		96	%	70 - 130
			Front Half Manganese (Mn)	2015/10/28		100	%	70 - 130
			Front Half Nickel (Ni)	2015/10/28		100	%	70 - 130
			Front Half Selenium (Se)	2015/10/28		99	%	70 - 130
			Front Half Silver (Ag)	2015/10/28		98	%	70 - 130
			Front Half Zinc (Zn)	2015/10/28		101	%	70 - 130
4248561	N_R	MS/MSD RPD	Front Half Antimony (Sb)	2015/10/28	1.0		%	20
			Front Half Arsenic (As)	2015/10/28	1.0		%	20
			Front Half Barium (Ba)	2015/10/28	0		%	20

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Front Half Beryllium (Be)	2015/10/28	1.0		%	20
			Front Half Cadmium (Cd)	2015/10/28	1.0		%	20
			Front Half Chromium (Cr)	2015/10/28	1.0		%	20
			Front Half Cobalt (Co)	2015/10/28	1.0		%	20
			Front Half Copper (Cu)	2015/10/28	0		%	20
			Front Half Lead (Pb)	2015/10/28	3.1		%	20
			Front Half Manganese (Mn)	2015/10/28	0		%	20
			Front Half Nickel (Ni)	2015/10/28	2.0		%	20
			Front Half Selenium (Se)	2015/10/28	1.0		%	20
			Front Half Silver (Ag)	2015/10/28	0		%	20
			Front Half Zinc (Zn)	2015/10/28	0.99		%	20
4248561	N_R	Spiked Blank	Front Half Antimony (Sb)	2015/10/28		100	%	85 - 115
			Front Half Arsenic (As)	2015/10/28		100	%	85 - 115
			Front Half Barium (Ba)	2015/10/28		100	%	85 - 115
			Front Half Beryllium (Be)	2015/10/28		96	%	85 - 115
			Front Half Cadmium (Cd)	2015/10/28		97	%	85 - 115
			Front Half Chromium (Cr)	2015/10/28		101	%	85 - 115
			Front Half Cobalt (Co)	2015/10/28		102	%	85 - 115
			Front Half Copper (Cu)	2015/10/28		101	%	85 - 115
			Front Half Lead (Pb)	2015/10/28		102	%	85 - 115
			Front Half Manganese (Mn)	2015/10/28		102	%	85 - 115
			Front Half Nickel (Ni)	2015/10/28		100	%	85 - 115
			Front Half Selenium (Se)	2015/10/28		99	%	85 - 115
			Front Half Silver (Ag)	2015/10/28		101	%	85 - 115
			Front Half Zinc (Zn)	2015/10/28		100	%	85 - 115
4248561	N_R	Spiked Blank DUP	Front Half Antimony (Sb)	2015/10/28		100	%	85 - 115
			Front Half Arsenic (As)	2015/10/28		99	%	85 - 115
			Front Half Barium (Ba)	2015/10/28		99	%	85 - 115
			Front Half Beryllium (Be)	2015/10/28		96	%	85 - 115
			Front Half Cadmium (Cd)	2015/10/28		97	%	85 - 115
			Front Half Chromium (Cr)	2015/10/28		100	%	85 - 115
			Front Half Cobalt (Co)	2015/10/28		101	%	85 - 115
			Front Half Copper (Cu)	2015/10/28		100	%	85 - 115
			Front Half Lead (Pb)	2015/10/28		100	%	85 - 115
			Front Half Manganese (Mn)	2015/10/28		101	%	85 - 115
			Front Half Nickel (Ni)	2015/10/28		99	%	85 - 115
			Front Half Selenium (Se)	2015/10/28		99	%	85 - 115
			Front Half Silver (Ag)	2015/10/28		101	%	85 - 115
			Front Half Zinc (Zn)	2015/10/28		100	%	85 - 115
4248561	N_R	RPD	Front Half Antimony (Sb)	2015/10/28	0.46		%	20
			Front Half Arsenic (As)	2015/10/28	0.52		%	20
			Front Half Barium (Ba)	2015/10/28	0.31		%	20
			Front Half Beryllium (Be)	2015/10/28	0.039		%	20
			Front Half Cadmium (Cd)	2015/10/28	0.15		%	20
			Front Half Chromium (Cr)	2015/10/28	1.5		%	20
			Front Half Cobalt (Co)	2015/10/28	0.80		%	20
			Front Half Copper (Cu)	2015/10/28	0.96		%	20
			Front Half Lead (Pb)	2015/10/28	1.4		%	20
			Front Half Manganese (Mn)	2015/10/28	1.0		%	20
			Front Half Nickel (Ni)	2015/10/28	0.69		%	20
			Front Half Selenium (Se)	2015/10/28	0.40		%	20
			Front Half Silver (Ag)	2015/10/28	0.83		%	20
			Front Half Zinc (Zn)	2015/10/28	0.30		%	20

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Mostardi Platt
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4248561	N_R	Method Blank	Front Half Antimony (Sb)	2015/10/28	<0.40		ug	
			Front Half Arsenic (As)	2015/10/28	<0.40		ug	
			Front Half Barium (Ba)	2015/10/28	4.3,		ug	
					RDL=3.0			
			Front Half Beryllium (Be)	2015/10/28	<0.10		ug	
			Front Half Cadmium (Cd)	2015/10/28	<0.10		ug	
			Front Half Chromium (Cr)	2015/10/28	<0.30		ug	
			Front Half Cobalt (Co)	2015/10/28	<0.10		ug	
			Front Half Copper (Cu)	2015/10/28	<2.0		ug	
			Front Half Lead (Pb)	2015/10/28	<0.20		ug	
			Front Half Manganese (Mn)	2015/10/28	<0.75		ug	
			Front Half Nickel (Ni)	2015/10/28	<0.50		ug	
			Front Half Selenium (Se)	2015/10/28	<1.0		ug	
			Front Half Silver (Ag)	2015/10/28	<0.20		ug	
			Front Half Zinc (Zn)	2015/10/28	6.3,		ug	
					RDL=5.0			
4248561	N_R	RPD - Sample/Sample Dup	Front Half Antimony (Sb)	2015/10/28	0.80		%	20
			Front Half Arsenic (As)	2015/10/28	NC		%	20
			Front Half Barium (Ba)	2015/10/28	NC		%	20
			Front Half Beryllium (Be)	2015/10/28	NC		%	20
			Front Half Cadmium (Cd)	2015/10/28	4.5		%	20
			Front Half Chromium (Cr)	2015/10/28	NC		%	20
			Front Half Cobalt (Co)	2015/10/28	NC		%	20
			Front Half Copper (Cu)	2015/10/28	0.92		%	20
			Front Half Lead (Pb)	2015/10/28	0.30		%	20
			Front Half Manganese (Mn)	2015/10/28	NC		%	20
			Front Half Nickel (Ni)	2015/10/28	2.3		%	20
			Front Half Selenium (Se)	2015/10/28	NC		%	20
			Front Half Silver (Ag)	2015/10/28	NC		%	20
			Front Half Zinc (Zn)	2015/10/28	NC		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.


Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ralph Siebert, Operations Manager - Inorganic Analyses

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



October 30, 2015

Jenna Ghanma
Mostardi Platt
888 Industrial Drive
Elmhurst, IL 60123

Enclosed is your final report for ERA's Stationary Source Audit Sample (SSAS) Program. Your final report includes an evaluation of all results submitted by your laboratory to ERA.

Data Evaluation Protocols: All analytes in ERA's SSAS Program have been evaluated comparing the reported result to the acceptance limits generated using the criteria contained in the TNI SSAS Table.

For any "Not Acceptable" results, please contact your state regulator for any corrective action requirements.

Thank you for your participation in ERA's SSAS Program. If you have any questions, please contact our Proficiency Testing Department at 1-800-372-0122.

Sincerely,

David Kilhefner
Quality Officer

cc: Project File Number 092915O



A Waters Company

Recipient Type	Report Recipient	Contact	Project ID
Agency	IL-EPA Region 5 (SSAS) 77 W Jackson Blvd AE-17J Chicago, IL 60604 USA	Dakota Prentice prentice.dakota@epa.gov Phone: 312-886-6761	
Facility	Behr Iron And Metal 1100 Seminary St Rockford, IL 61104 USA	John Pinion jpinion@rka-inc.com Phone: 630-393-9000	
Lab	Maxxam Analytics Inc 6740 Campobello Rd Mississauga, ON L5N 2L8 Canada	Clayton Johnson Sr. Project Manager cjohnson@maxxam.ca Phone: (905) 817-5769	
Tester	Mostardi Platt 888 Industrial Drive Elmhurst, IL 60123 USA	Jenna Ghanma jghanma@mp-mail.com Phone: 630-993-2685	Behr M154005





0929150 Laboratory Exception Report

Project No. M154005C
Rotary Dryer Discharge

A Waters Company

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

Evaluation Checks

There are no values reported with < where the assigned value was greater than 0.

Not Acceptable Evaluations

There were no Not Acceptable evaluations for this study.





A Waters Company

Project No. M154005C
Rotary Dryer Discharge

Final Report Results For Laboratory Maxxam Analytics Inc





A Waters Company

Project No. M154005C
Rotary Dryer Discharge

SSAP Evaluation Report

Project Number: 0929150

ERA Customer Number: M748564

Laboratory Name: Maxxam Analytics Inc

Inorganic Results





0929150 Evaluation Final Complete Report

A Waters Company

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campbell Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

Project No. M154005
Rotary Dryer Discharge

Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Metals on Filter Paper (cat# 1425, lot# 0929150) Study Dates: 09/29/15 - 10/30/15									
1005	Antimony	µg/Filter	32.2	31.9	23.9 - 39.9	Acceptable	EPA Method 29 2000	10/28/2015	
1010	Arsenic	µg/Filter	26.4	27.3	20.5 - 34.1	Acceptable	EPA Method 29 2000	10/28/2015	
1015	Barium	µg/Filter	31.4	27.2	20.4 - 34.0	Acceptable	EPA Method 29 2000	10/28/2015	
1020	Beryllium	µg/Filter	12.5	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1030	Cadmium	µg/Filter	13.2	13.6	10.9 - 16.3	Acceptable	EPA Method 29 2000	10/28/2015	
1040	Chromium	µg/Filter	21.0	20.4	16.3 - 24.5	Acceptable	EPA Method 29 2000	10/28/2015	
1050	Cobalt	µg/Filter	14.6	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1055	Copper	µg/Filter	14.2	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1075	Lead	µg/Filter	27.4	27.2	21.8 - 32.6	Acceptable	EPA Method 29 2000	10/28/2015	
1090	Manganese	µg/Filter	14.5	13.6	9.52 - 17.7	Acceptable	EPA Method 29 2000	10/28/2015	
1105	Nickel	µg/Filter	27.1	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	
1140	Selenium	µg/Filter	26.9	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	
1150	Silver	µg/Filter	40.8	40.8	28.6 - 53.0	Acceptable	EPA Method 29 2000	10/28/2015	
1165	Thallium	µg/Filter		40.8	30.6 - 51.0	Not Reported			
1190	Zinc	µg/Filter	29.0	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	



0929150 Evaluation Final Complete Report

A Waters Company

Project No. M1540056
Rotary Dryer Discharge

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campbell Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

QAI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Metals in Impinger Solution (cat# 1426, lot# 0929150) Study Dates: 09/29/15 - 10/30/15									
1005	Antimony	µg/mL	1.78	1.70	1.28 - 2.12	Acceptable	EPA Method 29 2000	10/27/2015	
1010	Arsenic	µg/mL	0.902	0.895	0.671 - 1.12	Acceptable	EPA Method 29 2000	10/27/2015	
1015	Barium	µg/mL	1.10	1.05	0.788 - 1.31	Acceptable	EPA Method 29 2000	10/27/2015	
1020	Beryllium	µg/mL	1.45	1.35	1.01 - 1.69	Acceptable	EPA Method 29 2000	10/27/2015	
1030	Cadmium	µg/mL	1.17	1.12	0.896 - 1.34	Acceptable	EPA Method 29 2000	10/27/2015	
1040	Chromium	µg/mL	2.51	2.42	1.94 - 2.90	Acceptable	EPA Method 29 2000	10/27/2015	
1050	Cobalt	µg/mL	1.96	1.75	1.31 - 2.19	Acceptable	EPA Method 29 2000	10/27/2015	
1055	Copper	µg/mL	1.29	1.22	0.915 - 1.52	Acceptable	EPA Method 29 2000	10/27/2015	
1075	Lead	µg/mL	0.719	0.695	0.521 - 0.869	Acceptable	EPA Method 29 2000	10/27/2015	
1090	Manganese	µg/mL	0.343	0.326	0.244 - 0.408	Acceptable	EPA Method 29 2000	10/27/2015	
1105	Nickel	µg/mL	0.372	0.357	0.286 - 0.428	Acceptable	EPA Method 29 2000	10/27/2015	
1140	Selenium	µg/mL	1.81	1.80	1.35 - 2.25	Acceptable	EPA Method 29 2000	10/27/2015	
1150	Silver	µg/mL	0.878	0.818	0.614 - 1.02	Acceptable	EPA Method 29 2000	10/27/2015	
1165	Thallium	µg/mL		1.59	1.19 - 1.99	Not Reported			
1190	Zinc	µg/mL	1.74	1.64	1.23 - 2.05	Acceptable	EPA Method 29 2000	10/27/2015	



Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Project Number: M154005
 Test Location: Rotary Dryer Discharge

Test Method: 5/29
 Filterable Analysis Date: 10/14/2015

Filter Drying Temp °F: Ambient-Des. 24 hrs
 Analyst: JMG

Description	Sample Date	ID#	vol. (ml)	Initial Weight (grams)	Final Weight (grams)	Net Weight Gain (grams)
Filterable Particulate						
Test No. 1	10/7/2015					
Source Condition: Normal						
M5 Filter		8884		0.4462	1.0937	0.6475
Acetone Wash (Teflon Baggies)		566	68 ml	1.3480	1.4508	0.1028
Acetone Blank						0.0003
Total Front Half Weight						0.7500
Filterable Particulate						
Test No. 2	10/7/2015					
Source Condition: Normal						
M5 Filter		8847		0.4445	0.8094	0.3649
Acetone Wash (Teflon Baggies)		567	82 ml	1.3170	1.5684	0.2514
Acetone Blank						0.0004
Total Front Half Weight						0.6159
Filterable Particulate						
Test No. 3	10/7/2015					
Source Condition: Normal						
M5 Filter		8848		0.4493	0.9762	0.5269
Acetone Wash (Teflon Baggies)		568	86 ml	1.3318	1.7808	0.4490
Acetone Blank						0.0003
Total Front Half Weight						0.9756

Appendix E - Reference Method Test Data (Computerized Sheets)

Client:	Rk & Associates, Inc.		
Facility:	Behr Iron and Metal Rockford Facility		
Test Location:	Rotary Dryer Discharge		
Project #:	M154005		
Test Method:	5/29		
Test Engineer:	BRS		
Test Technician:	SPC		
	<u>R1</u>	<u>R2</u>	<u>R3</u>
Temp ID:	CM25	CM25	CM25
Meter ID:	CM25	CM25	CM25
Pitot ID:	118	118	118
Nozzle Diameter (Inches):	0.494	0.494	0.494
Meter Calibration Factor (Y):	1.016	1.016	1.016
Meter Orifice Setting (Delta H):	1.751	1.751	1.751
Nozzle Kit ID Number and Material:	Teflon #4	Teflon #4	Teflon #4
Pitot Tube Coefficient:		0.840	
Probe Length (Feet):		3.0	
Probe Liner Material:		Glass	
Sample Plane:		Horizontal	
Port Length (Inches):		4.00	
Port Size (Diameter, Inches):		6.00	
Port Type:		Nipple	
Duct Shape:		Circular	
Diameter (Feet):		1.5	
Duct Area (Square Feet):		1.767	
Upstream Diameters:		0.500	
Downstream Diameters:		2.000	
Number of Ports Sampled:		1	
Number of Points per Port:		1	
Minutes per Point:		120.0	
Minutes per Reading:		5.0	
Total Number of Traverse Points:		1	
Test Length (Minutes):		120	
Train Type:		Anderson Box	
Source Condition:		Normal	
Servomex Serial Number:		01440D1/3935	
Moisture Balance ID:		S10-37	
# of Runs		3	

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Rotary Dryer Discharge
Test Method: 5/29

Source Condition:		Normal Run 1	Normal Run 2	Normal Run 3
Identify Analyte:	Antimony (Sb)			
Molecular Weight:	121.75	ADL	ADL	DLL
ug (net) collected:		35.38	40.75	27.16
Identify Analyte:	Arsenic (As)			
Molecular Weight:	74.92	DLL	BDL	DLL
ug (net) collected:		20.26	20.20	20.36
Identify Analyte:	Beryllium (Be)			
Molecular Weight:	9.01	BDL	BDL	BDL
ug (net) collected:		5.05	5.05	5.05
Identify Analyte:	Cadmium (Cd)			
Molecular Weight:	112.4	ADL	BDL	BDL
ug (net) collected:		6.545	5	5
Identify Analyte:	Chromium (Cr)			
Molecular Weight:	51.99	ADL	ADL	ADL
ug (net) collected:		4369.73	2839.40	1710.28
Identify Analyte:	Cobalt (Co)			
Molecular Weight:	58.93	ADL	ADL	ADL
ug (net) collected:		740.23	1451.58	906.46
Identify Analyte:	Copper (Cu)			
Molecular Weight:	63.55	ADL	ADL	ADL
ug (net) collected:		66316.30	149008.10	481028.10
Identify Analyte:	Lead (Pb)			
Molecular Weight:	207.19	ADL	ADL	ADL
ug (net) collected:		3221.56	1930.96	2395.56
Identify Analyte:	Manganese (Mn)			
Molecular Weight:	54.94	ADL	ADL	ADL
ug (net) collected:		8859.2	3589.23	636.44
Identify Analyte:	Nickel (Ni)			
Molecular Weight:	58.71	ADL	ADL	ADL
ug (net) collected:		46604.44	29908.12	21307.49
Identify Analyte:	Selenium (Se)			
Molecular Weight:	78.96	DLL	DLL	DLL
ug (net) collected:		58.92	102.50	51.20

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility
Test Location: Rotary Dryer Discharge
Test Method: 5/29

Source Condition:		Normal Run 1	Normal Run 2	Normal Run 3
Identify Analyte:	Silver (Ag)			
Molecular Weight:	107.87	BDL	BDL	DLL
ug (net) collected:		10.1	10.1	18.10
Identify Analyte:	Zinc (Zn)			
Molecular Weight:	65.37	ADL	ADL	ADL
ug (net) collected:		103017.70	29219.5	4391.8
Identify Analyte:	Barium (Ba)			
Molecular Weight:	137.33	BDL	BDL	DLL
ug (net) collected:		151.5	151.5	153.80

Run 1-Method 5/29

Client: Rk & Associates, Inc.
Facility: Behr Iron and Metal Rockford Facility

Test Location: Rotary Dryer Discharge

Source Condition: Normal

Date: 10/7/15
Start Time: 8:20
End Time: 10:20

DRY GAS METER CONDITIONS				STACK CONDITIONS			
ΔH:	1.73	in. H ₂ O		Static Pressure	-5.00	in. H ₂ O	
Meter Temperature, T _m :	71.4	°F		Flue Pressure (Ps):	29.02	in. Hg. abs.	
Sqrt ΔP:	0.000	in. H ₂ O		Carbon Dioxide:	0.00	%	
Stack Temperature, T _s :	450.9	°F		Oxygen:	20.90	%	
Meter Volume, V _m :	81.935	ft ³		Nitrogen:	79.10	%	
Meter Volume, V _{mstd} :	81.593	dscf		Gas Weight dry, M _d :	28.836	lb/lb mole	
Meter Volume, V _{wstd} :	1.912	wscf		Gas Weight wet, M _s :	28.588	lb/lb mole	
Isokinetic Variance:	#DIV/0!	%		Excess Air:	---	%	
				Gas Velocity, V _s :	0.000	fps	
Test Length	120.00	in mins.		Volumetric Flow:	0	acfm	
Nozzle Diameter	0.494	in inches		Volumetric Flow:	0	dscfm	
Barometric Pressure	29.39	in Hg		Volumetric Flow:	0	scfm	
Calculated Fo:	#DIV/0!			Fo Validity:	#DIV/0!		

MOISTURE DETERMINATION					
Initial Impinger Content:	2004.5	ml	Silica Initial Wt.	751.2	grams
Final Impinger Content:	2020.4	ml	Silica Final Wt.	775.9	grams
Impinger Difference:	15.9	ml	Silica Difference:	24.7	grams
Total Water Gain:	40.6		Moisture, Bws:	0.023	

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	8:20:00	0.00	1.73	3.460	377	65	65	0.000	3.725	0.000
1-1	8:25:00	0.00	1.73	7.185	385	67	65	0.000	3.300	0.000
1-1	8:30:00	0.00	1.73	10.485	400	68	65	0.000	3.750	0.000
1-1	8:35:00	0.00	1.73	14.235	395	69	65	0.000	3.250	0.000
1-1	8:40:00	0.00	1.73	17.485	372	71	66	0.000	3.333	0.000
1-1	8:45:00	0.00	1.73	20.818	367	71	66	0.000	3.256	0.000
1-1	8:50:00	0.00	1.73	24.074	418	73	67	0.000	3.345	0.000
1-1	8:55:00	0.00	1.73	27.419	535	75	68	0.000	3.222	0.000
1-1	9:00:00	0.00	1.73	30.641	592	76	69	0.000	3.255	0.000
1-1	9:05:00	0.00	1.73	33.896	500	77	70	0.000	3.250	0.000
1-1	9:10:00	0.00	1.73	37.146	476	77	70	0.000	3.400	0.000
1-1	9:15:00	0.00	1.73	40.546	535	76	71	0.000	3.255	0.000
1-1	9:20:00	0.00	1.73	43.801	580	76	72	0.000	3.300	0.000
1-1	9:25:00	0.00	1.73	47.101	603	75	73	0.000	3.280	0.000
1-1	9:30:00	0.00	1.73	50.381	480	74	72	0.000	3.210	0.000
1-1	9:35:00	0.00	1.73	53.591	394	74	71	0.000	3.265	0.000
1-1	9:40:00	0.00	1.73	56.856	383	74	72	0.000	3.250	0.000
1-1	9:45:00	0.00	1.73	60.106	361	73	72	0.000	3.300	0.000
1-1	9:50:00	0.00	1.73	63.406	349	74	72	0.000	3.250	0.000
1-1	9:55:00	0.00	1.73	66.656	342	74	72	0.000	3.750	0.000
1-1	10:00:00	0.00	1.73	70.406	329	74	72	0.000	3.800	0.000
1-1	10:05:00	0.00	1.73	74.206	442	74	72	0.000	3.900	0.000
1-1	10:10:00	0.00	1.73	78.106	507	74	72	0.000	3.500	0.000
1-1	10:15:00	0.00	1.73	81.606	550	74	72	0.000	3.789	0.000
	10:20:00			85.395	600	74	72			
Total		2:00:00		81.935		73.2	69.7		81.935	
Average			1.73		450.9	71.4		0.000		
Min			1.73		329.0	65.0		0.000		
Max			1.73		603.0	77.0		0.000		

Run 2-Method 5/29

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Rotary Dryer Discharge
 Source Condition: Normal

Date: 10/7/15
 Start Time: 11:05
 End Time: 13:05

DRY GAS METER CONDITIONS				STACK CONDITIONS		
ΔH :	1.73	in. H ₂ O		Static Pressure	-0.50	in. H ₂ O
Meter Temperature, T _m :	79.7	°F		Flue Pressure (Ps):	29.35	in. Hg. abs.
Sqrt ΔP :	0.000	in. H ₂ O		Carbon Dioxide:	0.00	%
Stack Temperature, T _s :	411.0	°F		Oxygen:	20.90	%
Meter Volume, V _m :	89.180	ft ³		Nitrogen:	79.1	%
Meter Volume, V _{mstd} :	87.454	dscf		Gas Weight dry, M _d :	28.836	lb/lb mole
Meter Volume, V _{wstd} :	1.950	wscf		Gas Weight wet, M _s :	28.600	lb/lb mole
Isokinetic Variance:	#DIV/0!	%		Excess Air:	—	%
Test Length	120.00	in mins.		Gas Velocity, V _s :	0.000	fps
Nozzle Diameter	0.494	in inches		Volumetric Flow:	0	acfm
Barometric Pressure	29.39	in Hg		Volumetric Flow:	0	dscfm
Calculated Fo:	#DIV/0!			Volumetric Flow:	0	scfm
				Fo Validity:	#DIV/0!	

MOISTURE DETERMINATION

Initial Impinger Content:	2074.3	ml	Silica Initial Wt.	791.6	grams
Final Impinger Content:	2093.6	ml	Silica Final Wt.	813.7	grams
Impinger Difference:	19.3	ml	Silica Difference:	22.1	grams
Total Water Gain:	41.4		Moisture, Bws:	0.022	

Port- Point No.	Clock Time	Velocity Head Δp in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Sqrt. Δp	Collected Vol. ft ³	Point Vel ft/sec
1-1	11:05:00	0.00	1.73	91.472	513	73	72	0.000	3.750	0.000
1-1	11:10:00	0.00	1.73	95.222	386	78	73	0.000	3.800	0.000
1-1	11:15:00	0.00	1.73	99.022	415	78	73	0.000	3.777	0.000
1-1	11:20:00	0.00	1.73	102.799	341	79	74	0.000	3.211	0.000
1-1	11:25:00	0.00	1.73	106.010	328	80	74	0.000	3.750	0.000
1-1	11:30:00	0.00	1.73	108.760	315	80	75	0.000	3.750	0.000
1-1	11:35:00	0.00	1.73	113.510	307	81	76	0.000	3.800	0.000
1-1	11:40:00	0.00	1.73	117.310	310	81	76	0.000	3.650	0.000
1-1	11:45:00	0.00	1.73	120.960	320	81	76	0.000	3.750	0.000
1-1	11:50:00	0.00	1.73	124.710	334	82	77	0.000	3.750	0.000
1-1	11:55:00	0.00	1.73	128.460	400	83	77	0.000	3.775	0.000
1-1	12:00:00	0.00	1.73	132.235	393	84	77	0.000	3.750	0.000
1-1	12:05:00	0.00	1.73	135.985	532	84	78	0.000	3.811	0.000
1-1	12:10:00	0.00	1.73	139.796	720	85	78	0.000	3.777	0.000
1-1	12:15:00	0.00	1.73	143.573	565	85	78	0.000	3.850	0.000
1-1	12:20:00	0.00	1.73	147.423	420	85	79	0.000	3.650	0.000
1-1	12:25:00	0.00	1.73	151.073	721	85	79	0.000	3.455	0.000
1-1	12:30:00	0.00	1.73	154.528	413	84	79	0.000	3.750	0.000
1-1	12:35:00	0.00	1.73	158.278	357	84	79	0.000	3.800	0.000
1-1	12:40:00	0.00	1.73	162.078	342	84	80	0.000	3.650	0.000
1-1	12:45:00	0.00	1.73	165.728	346	84	80	0.000	3.789	0.000
1-1	12:50:00	0.00	1.73	169.517	350	84	80	0.000	3.785	0.000
1-1	12:55:00	0.00	1.73	173.302	365	85	80	0.000	3.561	0.000
1-1	13:00:00	0.00	1.73	176.863	370	85	80	0.000	3.789	0.000
	13:05:00			180.652						
Total		2:00:00		89.180		82.3	77.1		89.180	
Average			1.73		411.0	79.7		0.000		
Min			1.73		307.0	72.0		0.000		
Max			1.73		721.0	85.0		0.000		

Run 3-Method 5/29

Client: Rk & Associates, Inc.
 Facility: Behr Iron and Metal Rockford Facility
 Test Location: Rotary Dryer Discharge
 Source Condition: Normal

Date: 10/7/15
 Start Time: 13:48
 End Time: 15:48

DRY GAS METER CONDITIONS				STACK CONDITIONS			
ΔH :	1.73	in. H ₂ O		Static Pressure	-0.50	in. H ₂ O	
Meter Temperature, T _m :	84.0	°F		Flue Pressure (Ps):	29.35	in. Hg. abs.	
Sqrt ΔP :	0.000	in. H ₂ O		Carbon Dioxide:	0.00	%	
Stack Temperature, T _s :	555.8	°F		Oxygen:	20.90	%	
Meter Volume, V _m :	91.209	ft ³		Nitrogen:	79.1	%	
Meter Volume, V _{mstd} :	88.732	dscf		Gas Weight dry, M _d :	28.836	lb/lb mole	
Meter Volume, V _{wstd} :	2.529	wscf		Gas Weight wet, M _s :	28.536	lb/lb mole	
Isokinetic Variance:	#DIV/0!	%		Excess Air:	---	%	
Test Length	120.00	in mins.		Gas Velocity, V _s :	0.000	fps	
Nozzle Diameter	0.494	in inches		Volumetric Flow:	0	acfm	
Barometric Pressure	29.39	in Hg		Volumetric Flow:	0	dscfm	
Calculated Fo:	#DIV/0!			Volumetric Flow:	0	scfm	
				Fo Validity:	#DIV/0!		

MOISTURE DETERMINATION					
Initial Impinger Content:	2000.3	ml	Silica Initial Wt.	754.7	grams
Final Impinger Content:	2031.2	ml	Silica Final Wt.	777.5	grams
Impinger Difference:	30.9	ml	Silica Difference:	22.8	grams
Total Water Gain:	53.7		Moisture, Bws:	0.028	

Port- Point No.	Clock Time	Velocity Head ΔP in. H ₂ O	Orifice ΔH in. H ₂ O	Actual Meter Vol. ft ³	Stack Temp °F	Meter Temp Inlet °F	Meter Temp Outlet °F	Sqrt. ΔP	Collected Vol. ft ³	Point Vel ft/sec
1-1	13:48:00	0.00	1.73	87.430	548	80	79	0.000	3.750	0.000
1-1	13:53:00	0.00	1.73	91.180	381	84	80	0.000	3.800	0.000
1-1	13:58:00	0.00	1.73	94.980	363	86	80	0.000	3.777	0.000
1-1	14:03:00	0.00	1.73	98.757	385	86	80	0.000	3.666	0.000
1-1	14:08:00	0.00	1.73	102.423	358	88	82	0.000	3.854	0.000
1-1	14:13:00	0.00	1.73	106.277	284	91	81	0.000	3.750	0.000
1-1	14:18:00	0.00	1.73	110.027	322	92	82	0.000	3.755	0.000
1-1	14:23:00	0.00	1.73	113.782	467	88	82	0.000	3.569	0.000
1-1	14:28:00	0.00	1.73	117.351	580	88	82	0.000	3.965	0.000
1-1	14:33:00	0.00	1.73	121.316	746	88	83	0.000	3.750	0.000
1-1	14:38:00	0.00	1.73	125.066	827	89	83	0.000	3.920	0.000
1-1	14:43:00	0.00	1.73	128.986	815	88	83	0.000	3.850	0.000
1-1	14:48:00	0.00	1.73	132.836	750	87	83	0.000	3.650	0.000
1-1	14:53:00	0.00	1.73	136.486	750	86	83	0.000	3.850	0.000
1-1	14:58:00	0.00	1.73	140.336	750	85	83	0.000	3.777	0.000
1-1	15:03:00	0.00	1.73	144.113	700	85	83	0.000	3.845	0.000
1-1	15:08:00	0.00	1.73	147.958	685	84	83	0.000	3.716	0.000
1-1	15:13:00	0.00	1.73	151.674	711	84	83	0.000	3.935	0.000
1-1	15:18:00	0.00	1.73	155.609	468	84	83	0.000	3.750	0.000
1-1	15:23:00	0.00	1.73	159.359	622	84	83	0.000	3.850	0.000
1-1	15:28:00	0.00	1.73	163.209	502	84	83	0.000	3.655	0.000
1-1	15:33:00	0.00	1.73	166.864	500	84	82	0.000	3.755	0.000
1-1	15:38:00	0.00	1.73	170.619	428	84	82	0.000	3.566	0.000
1-1	15:43:00	0.00	1.73	174.185	398	83	82	0.000	4.454	0.000
	15:48:00			178.639						
Total		2:00:00		91.209		85.9	82.1		91.209	
Average			1.73		555.8	84.0		0.000		
Min			1.73		284.0	79.0		0.000		
Max			1.73		827.0	92.0		0.000		

Behr Iron and Metal
Rockford, IL

Time	CO2 %	O2%	
8:39:00	0.23	18.73	cal
8:40:00	7.66	12.76	cal
8:41:00	10.07	11.98	cal
8:42:00	10.07	12	cal
8:43:00	9.35	11.78	cal
8:44:00	0.13	0.13	cal
8:45:00	0.03	-0.04	cal
8:46:00	0.01	0.04	cal
8:47:00	0.02	0.04	cal
8:48:00	18.74	20.13	cal
8:49:00	18.78	22.02	cal
8:50:00	18.82	22.05	cal
8:51:00	14.28	21.72	Ambient air in box truck
8:52:00	0.02	20.82	Ambient air in box truck
8:53:00	0.02	20.83	Ambient air in box truck
8:54:00	0.03	20.82	Ambient air in box truck
8:56:00	0.13	20.76	Test 1 Blue Baghouse Stack
8:57:00	0.13	20.77	Test 1 Blue Baghouse Stack
8:58:00	0.13	20.76	Test 1 Blue Baghouse Stack
8:59:00	0.1	20.82	Test 1 Blue Baghouse Stack
9:01:00	0.09	20.83	Test 1 Blue Baghouse Sweeco
9:02:00	0.09	20.83	Test 1 Blue Baghouse Sweeco
9:03:00	0.09	20.84	Test 1 Blue Baghouse Sweeco
9:05:00	0.24	20.57	Test 1 Blue Baghouse Inlet
9:06:00	0.24	20.57	Test 1 Blue Baghouse Inlet
9:07:00	0.23	20.57	Test 1 Blue Baghouse Inlet
9:08:00	0.23	20.58	Test 1 Blue Baghouse Inlet
9:11:00	0.11	20.71	Test 1 TPU Baghouse Exhaust
9:12:00	0.11	20.72	Test 1 TPU Baghouse Exhaust
9:13:00	0.11	20.72	Test 1 TPU Baghouse Exhaust
9:14:00	0.1	20.72	Test 1 TPU Baghouse Exhaust
9:17:00	0.04	0.1	cal
9:18:00	0.09	0.1	cal
9:19:00	3.03	5.4	cal
9:20:00	9.56	12.05	cal
9:21:00	9.99	12.1	cal
9:22:00	9.98	12.07	cal

Appendix F - Field Data Sheets

Isokinetic Sampling Cover Sheet

Test Engineer: BJS
Test Technician: SRG

Plant Information

Run Number: #1 Date: 16/7/15 Project Number: M154005
Test Location: TR INLET Client Name: Bayer AG Plant Name: ROCKWELL
Duct Shape: Circular or Rectangular Length: 1 Width: 1 or Diameter: 1.54
Flue Area: 1767 Upstream Diameters: 7.5 Downstream Diameters: 7.5
Port Type: Weld Port Length: 4 Port Diameter: 6
Test Method: MLH Source Condition: Normal

Meter and Probe Data

Meter ID: OM15 Meter Y Value: 1.016 ΔH Value: 1.751
Pitot ID: 118 Pitot Coefficient: .84 Train Type: Active
Nozzle Kit ID: Teflon #6 Nozzle Diameter: .494 Filter Number/Weight: 888-1
Probe Length: 35 Probe Liner: Glass Thimble Number/Weight: 1
Pre-Test Nozzle Leak Check: 0 @ 10 "Hg Post-Test Nozzle Leak Check: 0 @ 20 "Hg
Pre-Test Pitot Leak Check: 0 @ 3.0 "H₂O Post-Test Pitot Leak Check: 0 @ 3.0 "H₂O

Traverse Data

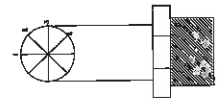
Ports Sampled: 1 Points/Port: 1 Min/Point: 120
Total Test Time: 120 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.34 Static Pressure: 5 Determined by: Method 3 or Method 3A
CO₂ %: 1 O₂ %: 1 / Avg. 20.9 Servomex Serial #: 014402/3935
Imp and/or silica balance Model and S/N: 510-557 Imp. Volume or Weight Gain: 15.9
Initial Imp. Volume or Weight: 2004.5 Final Imp. Volume or Weight: 2020.4
Initial Silica Weight: 751.2 Final Silica Weight: 775.9 Silica Weight Gain: 24.7

Comments:

Post-Test Nozzle Verification:



1) 1 2) 1 3) 1 4) 1

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 10/7/2015 Test Number: 285
 Client: Beth Ivon Test Location: TPD INLET Operator: SPL
 Plant: Rockford Test Method: M79 Page Number: 1 of 1

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1	0820	0	1.730	03.460	—	—	—	AAAAA	377	66	66	5	250	250	65
	0825			7.185					385	67	65	5	260	254	65
	0830			10.485					400	68	65	5	261	251	65
	0835			14.235					395	69	65	5	257	253	65
	0840			17.485					372	71	66	5	260	255	64
	0845			20.818					367	71	66	5	260	255	64
	0850			24.674					418	73	67	5	250	254	56
	0855			27.419					535	75	68	5	250	253	52
	0900			30.641					592	76	69	5	255	254	56
	0905			33.896					500	77	70	6	253	250	50
	0910			37.146					470	77	70	7	258	260	50
	0915			40.546					535	76	71	7	250	254	57
	0920			43.801					580	76	72	8	260	255	60
	0925			47.101					603	75	73	9	260	258	60
	0930			50.381					480	74	72	15	251	251	62
	0935			53.591					514	74	71	15	262	253	62
	0940			56.856					383	74	72	20	254	255	63
	0945			60.106					361	73	72	20	260	254	62
	0950			63.406					349	74	72	22	265	255	60
	0955			66.650					346	74	72	22	258	255	60
	1000			70.406					329	74	72	22	257	255	60
	1005			74.206					442	74	72	22	257	255	60
	1010			78.106					567	74	72	22	253	255	60
	1015			81.606					550	74	72	22	254	253	60
	1020			85.395					600	74	72	22	260	251	60
				91.935											

IMPINGER WEIGHT SHEET

PLANT: Behr

UNIT NO: TPU

LOCATION: Inlet

DATE: 10/7

TEST NO: 1 (D)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: S10-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	693.7	705.0		
IMPINGER 2	676.6	656.9		
IMPINGER 3	650.1	642.6		
IMPINGER 4	775.9	751.2		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2020.4 2004.5 15.9
FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 24.7
FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: BPS
Test Technician: SPC

Plant Information	
Run Number: <u>#2</u>	Date: <u>10/7/15</u>
Test Location: <u>TRU INLET</u>	Client Name: <u>BEHVIRON</u>
Duct Shape: <u>Circular or Rectangular</u>	Length: <u>—</u> Width: <u>—</u> or Diameter: <u>1.5 ft</u>
Flue Area: <u>1.767</u>	Upstream Diameters: <u>7.5</u>
Port Type: <u>Midline</u>	Port Length: <u>4"</u>
Test Method: <u>Midline</u>	Source Condition: <u>Normal</u>
Project Number: <u>M154005</u>	Plant Name: <u>Rockford</u>
Diameter: <u>1.5 ft</u>	Downstream Diameters: <u>7.2</u>
Port Diameter: <u>6"</u>	

Meter and Probe Data	
Meter ID: <u>CM 25</u>	Meter Y Value: <u>1.016</u>
Pitot ID: <u>118</u>	Pitot Coefficient: <u>.94</u>
Nozzle Kit ID: <u>SECTION #6</u>	Nozzle Diameter: <u>.494</u>
Probe Length: <u>3</u>	Probe Liner: <u>.045</u>
Pre-Test Nozzle Leak Check: <u>0</u>	"Hg Post-Test Nozzle Leak Check: <u>0 @ 22</u>
Pre-Test Pitot Leak Check: <u>1.03.0</u>	"H ₂ O Post-Test Pitot Leak Check: <u>1.03.0</u>
	"H ₂ O
	ΔH Value: <u>1.751</u>
	Train Type: <u>1.03.0</u>
	Filter Number/Weight: <u>8847</u>
	Thimble Number/Weight: <u>—</u>

Traverse Data	
Ports Sampled: <u>1</u>	Points/Port: <u>1</u>
Total Points: <u>1</u>	Total Test Time: <u>1.0</u>
	Min/Point: <u>1.0</u>
	Sample Plane: <u>Horizontal or Vertical</u>

Stack Parameters	
Barometric Pressure: <u>29.39</u>	Static Pressure: <u>-5</u>
CO ₂ %: <u>—</u>	O ₂ %: <u>—</u>
Imp and/or silica balance Model and S/N: <u>S10-37</u>	Avg. <u>20.9</u>
Initial Imp. Volume or Weight: <u>2074.3</u>	Servomex Serial #: <u>0440213935</u>
Initial Silica Weight: <u>291.6</u>	Imp. Volume or Weight Gain: <u>19.3</u>
	Final Silica Weight: <u>813.7</u>
	Silica Weight Gain: <u>22.1</u>

Comments:  1) ☒ 2) ☒ 3) ☒ 4) ☒

Post-Test Nozzle Verification:

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 10/7/2015 Test Number: #2
 Client: Bayer Test Location: RO INLET Operator: DLS Test Tech: SRC
 Plant: Rockford Test Method: M29 Page Number: 1 of 1

Port-Point #.	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, " Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-1	11:05		1.73	91.472					513	73	72	5	265	258	55
	11:10			95.222					386	78	73	8	260	250	54
	11:15			99.022					415	78	73	9	253	253	52
	11:20			102.799					341	79	74	10	250	250	53
	11:25			106.510					322	80	74	15	256	250	54
	11:30			109.760					315	80	75	20	257	257	55
	11:35			113.510					307	81	76	20	252	252	55
	11:40			117.310					310	81	76	20	252	252	55
	11:45			120.960					320	81	74	15	255	255	55
	11:50			124.710					334	82	77	15	250	257	57
	11:55			128.460					400	83	77	15	255	257	57
	12:00			135.985					353	84	77	15	250	248	57
	12:05			139.796					532	84	78	15	257	255	57
	12:10			142.573					710	85	78	15	255	255	58
	12:15			147.423					565	85	78	16	255	251	60
	12:20			151.073					420	85	79	16	260	257	60
	12:25			154.528					721	85	79	16	261	260	60
	12:30			158.278					413	84	76	16	255	266	61
	12:35			162.078					257	84	79	16	251	251	61
	12:40			165.718					342	84	80	16	252	254	61
	12:45			169.517					346	84	80	16	252	257	61
	12:50			173.307					350	84	80	16	250	251	61
	12:55			176.863					365	85	80	16	254	253	62
	13:00			180.652					370	85	80	16	253	254	63
	13:05			184.442											

IMPINGER WEIGHT SHEET

PLANT: Behr Iron & Metal

UNIT NO: TPU

LOCATION: exhaust

DATE: 10/7/15

TEST NO: 2 (D)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: 510-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	692.2	696.1		
IMPINGER 2	763.4	746.7		
IMPINGER 3	638.0	631.5		
IMPINGER 4	813.7	791.6		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2093.6 2074.3 19.3
FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 22.1
FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Isokinetic Sampling Cover Sheet

Test Engineer: BES

Test Technician: SRC

Plant Information

Run Number: #3 Date: 10/7/15 Project Number: M154005
 Test Location: TPU INLET Client Name: BERY IRON Plant Name: ROCKWELL
 Duct Shape: Circular or Rectangular Length: — Width: — or Diameter: 1.5 ft
 Flue Area: 1.767 Upstream Diameters: 2.5 Downstream Diameters: 22
 Port Type: Nozzle Port Length: 4" Port Diameter: 6"
 Test Method: M29 Source Condition: Normal

Meter and Probe Data

Meter ID: Q1M25 Meter Y Value: 1.016 ΔH Value: 1.751
 Pitot ID: 118 Pitot Coefficient: .74 Train Type: ANDESSON
 Nozzle Kit ID: Teflon #6 Nozzle Diameter: .494 Filter Number/Weight: 8848
 Probe Length: 36" Probe Liner: GLASS Thimble Number/Weight: —
 Pre-Test Nozzle Leak Check: 0 @ 15" Hg Post-Test Nozzle Leak Check: 0 @ 20" Hg
 Pre-Test Pitot Leak Check: 0 @ 30" H2O Post-Test Pitot Leak Check: 0 @ 40" H2O

Traverse Data

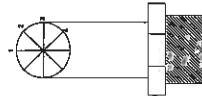
Ports Sampled: 1 Points/Port: 1 Min/Point: 20
 Total Test Time: 120 Sample Plane: Horizontal or Vertical

Stack Parameters

Barometric Pressure: 29.31 Static Pressure: -.5 Determined by: Method 3 or Method 3A
 CO₂ %: — / Avg. 0 O₂ %: — / Avg. 20.9 Servomex Serial #: 01440013935
 Imp and/or silica balance Model and S/N: S1037 Final Imp. Volume or Weight: 2038.2 Imp. Volume or Weight Gain: 30.9
 Initial Imp. Volume or Weight: 20003 Final Silica Weight: 754.7 Silica Weight Gain: 22.8

Comments:

Post-Test Nozzle Verification:



1) ✓ 2) ✓ 3) ✓ 4) ✓

Isokinetic Sampling Field Data Sheet

Project Number: M154005 Date: 10/1/15 Test Number: #3
 Client: Dehy & Sons Test Location: TRV M1ET Operator: BJJ Test Tech: SEC
 Plant: ROCKFORD Test Method: M79 Page Number: 1 of 1

Port-Point #	Time	(ΔP)	Orifice Setting (ΔH)	Meter Volume (V _m) ft ³ , Actual	Square Root, ΔP	Meter Rate, Cubic Feet/Min.	Theoretical Meter Volume, (V _m) ft ³ , per point	Theoretical Meter Volume, (V _m) ft ³ , total	Stack Temp, °F	Meter Temp Inlet, °F	Meter Temp Outlet, °F	Pump Vacuum, "Hg	Probe Temp, °F	Filter Temp, °F	Impinger Outlet Well Temp, °F
1-	1348	1.730		87.430					548	80	79	5	250	254	57
	1353			91.180					381	80	80	5	250	251	55
	1358			94.980					363	86	80	5	257	252	55
	1404			98.757					385	86	80	5	250	253	55
	1408			102.423					358	88	82	7	250	250	55
	1413			106.277					284	91	81	10	250	252	56
	1418			110.027					222	92	82	10	257	257	57
	1423			113.782					467	88	82	10	248	251	57
	1428			117.351					580	88	82	10	254	250	57
	1433			121.316					746	88	83	10	250	257	60
	1439			125.066					827	89	83	15	257	257	60
	1443			128.986					815	88	83	15	253	254	60
	1448			132.836					780	87	83	15	252	253	61
	1453			136.484					750	86	83	17	256	251	61
	1458			140.336					750	85	83	18	250	252	63
	1453			144.113					780	85	83	18	250	250	63
	1458			147.958					685	84	83	18	251	256	63
	1513			151.624					711	84	83	20	251	250	67
	1518			155.609					468	84	84	20	250	253	64
	1523			159.357					622	84	84	20	250	253	65
	1528			163.209					502	84	83	20	250	250	65
	1533			166.864					500	84	82	26	254	250	65
	1538			170.619					418	84	82	26	252	257	65
	1543			174.445					359	83	82	26	250	250	65
	1548			178.635											

IMPINGER WEIGHT SHEET

PLANT: Behr

UNIT NO: TPu Baghouse

LOCATION: Inlet

DATE: 10/7/15

TEST NO: 3 (A)

METHOD: 5/29

WEIGHED/MEASURED BY: MEP

BALANCE ID: 510-37

	FINAL WEIGHT	INITIAL WEIGHT	IMPINGER	IMPINGER
Circle One:	MLS / GRAMS	MLS / GRAMS	GAIN	CONTENTS
IMPINGER 1	706.8	706.3		
IMPINGER 2	674.4	649.7		
IMPINGER 3	650.0	644.3		
IMPINGER 4	777.5	754.7		
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				

IMPINGERS 2000.3 2036.2 30.9
FINAL TOTAL INITIAL TOTAL TOTAL IMPINGER GAIN

SILICA 22.8
FINAL TOTAL INITIAL TOTAL TOTAL SILICA GAIN

Appendix G - Calibration Data

MOSTARDI PLATT

Procedures for Method 5 and Flow Calibration

Nozzles

The nozzles are measured according to Method 5, Section 10.1

Dry Gas Meters

The test meters are calibrated according to Method 5, Section 10.3 and "Procedures for Calibrating and Using Dry Gas Volume Meters as Calibration Standards" by P.R. Westlin and R.T. Shigehara, March 10, 1978.

Analytical Balance

The accuracy of the analytical balance is checked with Class S, Stainless Steel Type 303 weights manufactured by F. Hopken and Son, Jersey City, New Jersey.

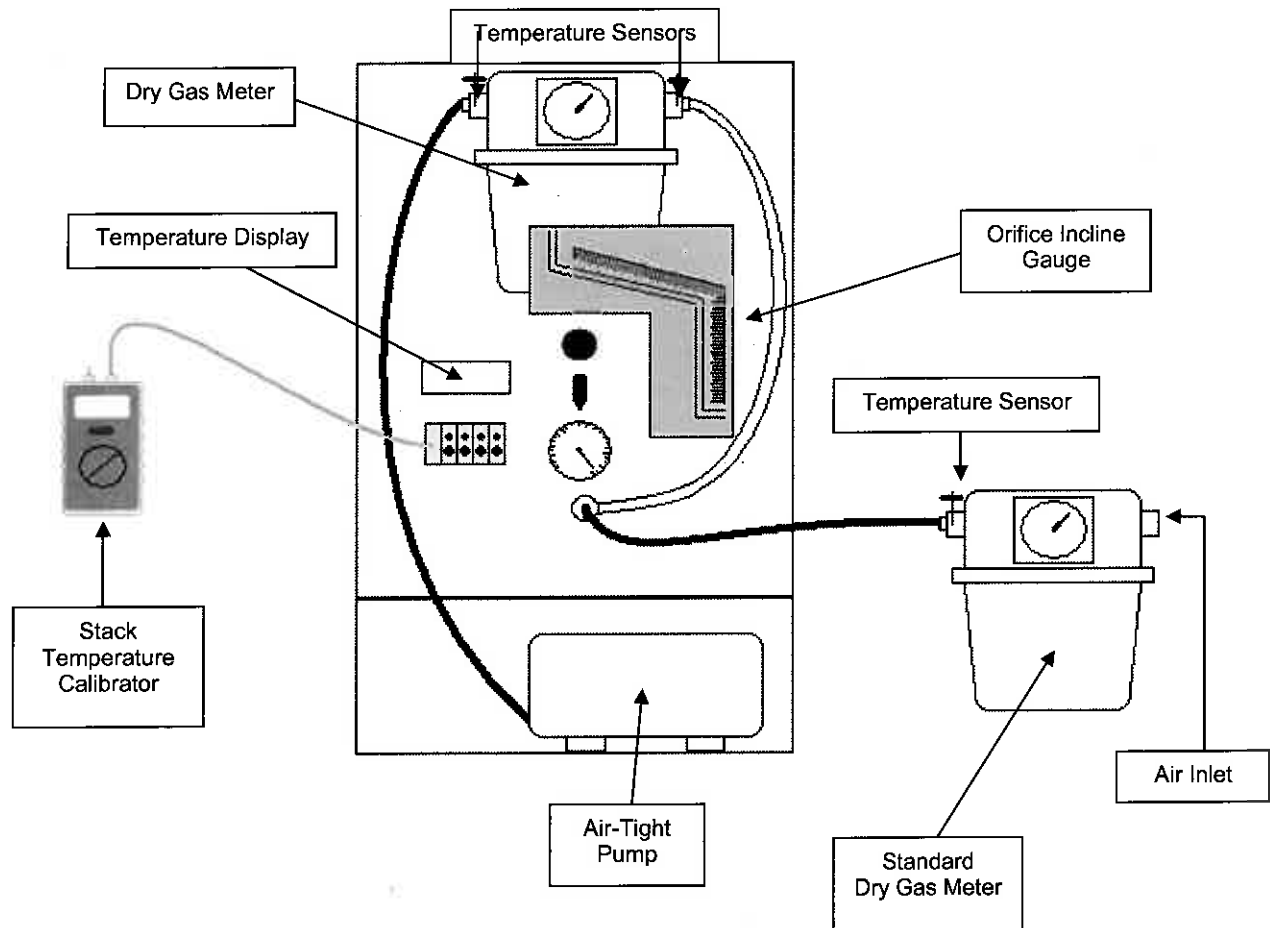
Temperature Sensing Devices

The potentiometer and thermocouples are calibrated utilizing a NBS traceable millivolt source.

Pitot Tubes

The pitot tubes utilized during this test program are manufactured according to the specification described and illustrated in the *Code of Federal Regulations*, Title 40, Part 60, Appendix A, Methods 1 and 2. The pitot tubes comply with the alignment specifications in Method 2, Section 10.1; and the pitot tube assemblies are in compliance with specifications in the same section.

Dry Gas Meter/Control Module Calibration Diagram



Meter Box Calibration

Dry Gas Meter Calibration Data

September 16, 2015

Date:
Calibrated By:
Barometric Pressure:

CM25
14159239
0.9979

Dry Gas Meter No.
Standard Meter No.
Standard Meter (Y)

Run Number	Orifice Setting in H ₂ O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		9.489	85.657	71	74	74					
Initial		4.255	80.502	71	74	74					
Difference 1	0.20	5.234	5.155	71	74	74	74	20	25	1.018	1.760
Final		15.632	91.727	72	76	75					
Initial		9.570	85.753	72	73	74					
Difference 2	0.50	6.062	5.974	72	75	75	75	14	58	1.016	1.767
Final		26.475	102.400	72	79	76					
Initial		15.720	91.805	72	75	75					
Difference 3	0.70	10.755	10.595	72	77	76	76	22	40	1.019	1.797
Final		31.921	7.777	73	78	77					
Initial		26.611	2.530	72	78	76					
Difference 4	0.90	5.310	5.247	73	78	77	77	9	45	1.017	1.754
Final		37.281	13.103	73	79	77					
Initial		32.137	8.000	73	77	76					
Difference 5	1.20	5.144	5.103	73	78	77	77	8	12	1.011	1.766
Final		104.135	80.387	71	75	74					
Initial		98.952	75.280	71	73	74					
Difference 6	2.00	5.183	5.107	71	74	74	74	6	13	1.013	1.664

Average 1.016 1.751

Stack Temperature Sensor Calibration

Meter Box # : CM25 Name : EWK

Ambient Temperature : 75 °F Date : September 16, 2015

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2014

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (° F)	Test Thermometer Temperature (° F)	Temperature Difference %
0	-2	0.4
250	248	0.3
600	597	0.3
1200	1200	0.0

$$\frac{(\text{Ref. Temp., } ^\circ\text{F} + 460) - (\text{Test Therm. Temp., } ^\circ\text{F} + 460)}{\text{Ref. Temp., } ^\circ\text{F} + 460} * 100 \leq 1.5 \%$$

Ref. Temp., °F + 460

Meter Box Calibration

Dry Gas Meter Calibration Data

October 8, 2015
KAG
29.35

Date:
Calibrated By:
Barometric Pressure:

CM25
4319699
1.0053

Dry Gas Meter No.
Standard Meter No.
Standard Meter (Y)

Run Number	Orifice Setting in H ₂ O Chg (H)	Standard Meter Gas Volume vr	Dry Gas Meter Gas Volume vd	Standard Meter Temp. F° tr	Dry Gas Meter Inlet Temp. F° tdi	Dry Gas Meter Outlet Temp. F° tdo	Dry Gas Meter Avg. Temp. F° td	Time Min	Time Sec	Y	Chg (H)
Final		53.135	89.753	65	67	66					
Initial		47.893	84.558	65	65	64					
Difference	1	5.242	5.195	65	66	65	66	20	0	1.015	1.640
Final		59.025	95.575	66	70	67					
Initial		53.306	89.911	65	67	66					
Difference	2	5.719	5.664	66	69	67	68	14	11	1.018	1.729
Final		64.282	900.878	66	71	68					
Initial		59.183	895.737	66	69	67					
Difference	3	5.099	5.141	66	70	68	69	10	42	1.001	1.732
Final		69.858	6.311	67	72	69					
Initial		64.575	1.061	66	70	69					
Difference	4	5.283	5.250	67	71	69	70	9	45	1.016	1.722
Final		76.584	12.986	67	74	70					
Initial		70.057	6.514	67	71	69					
Difference	5	6.527	6.472	67	73	70	71	10	35	1.018	1.772
Final		47.694	84.382	65	65	63					
Initial		42.391	79.182	65	62	62					
Difference	6	5.303	5.200	65	64	63	63	6	35	1.016	1.745

Average 1.014 1.723

Stack Temperature Sensor Calibration

Meter Box # : CM25 Name : KAG

Ambient Temperature : 68 °F Date : October 8, 2015

Calibrator Model # : CL23A

Serial # : T-249465

Date Of Certification : December 26, 2015

Primary Standards Directly Traceable National Institute of Standards and Technology (NIST)

Reference Source Temperature (°F)	Test Thermometer Temperature (°F)	Temperature Difference %
0	-1	0.2
250	248	0.3
600	597	0.3
1200	1201	0.1

$$\frac{(\text{Ref. Temp., } ^\circ\text{F} + 460) - (\text{Test Therm. Temp., } ^\circ\text{F} + 460)}{\text{Ref. Temp., } ^\circ\text{F} + 460} * 100 \leq 1.5 \%$$

Ref. Temp., °F + 460

S TYPE PITOT TUBE INSPECTION WORKSHEET

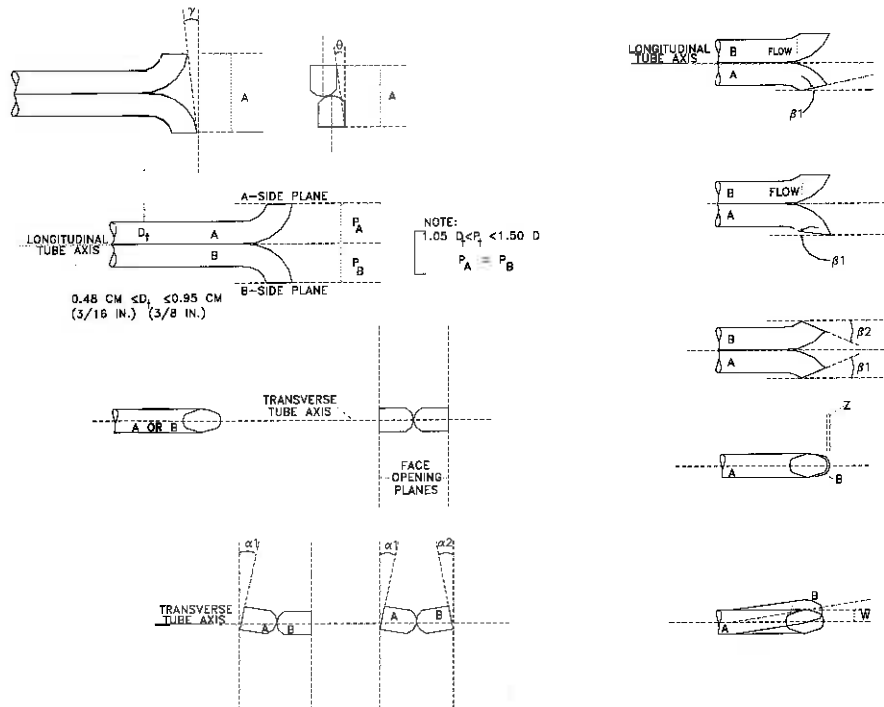
Pitot Tube No: 118

Date: 8/27/2015

Inspector's Name: KOJ

Type of Probe: (circle one) M2 **M5** M17

Probe Length: 3 ft.



Pitot tube assembly level? x yes no

Pitot tube openings damaged? yes (explain below) x no

$a_1 = 0^\circ (<10^\circ)$, $a_2 = 0.5^\circ (<10^\circ)$, $z = A \sin g = 0.025$ (in.); (<0.125 in.)
 $b_1 = 1.5^\circ (<5^\circ)$, $b_2 = 0.5^\circ (<5^\circ)$, $w = A \sin q = 0.025$ (in.); (<0.03125 in.)
 $\gamma = 1.5^\circ$, $\theta = 1.5^\circ$, $A = 0.950$ (in.), $P_A = 0.475$ (in.), $P_B = 0.475$ (in.), $D_1 = 0.375$ (in.)

Calibration required? yes x no

S TYPE PITOT TUBE INSPECTION WORKSHEET

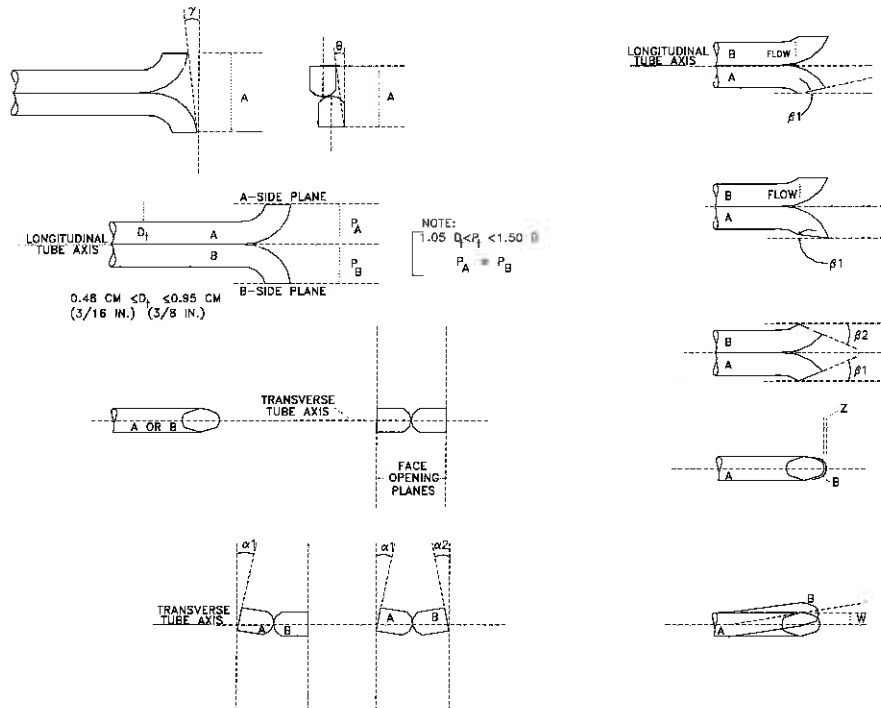
Pitot Tube No: 118

Date: 10/9/2015

Inspector's Name: JDV1

Type of Probe: (circle one) M2 M5 M17

Probe Length: 3 ft.



Pitot tube assembly level? ☒ yes ☐ no

Pitot tube openings damaged? ☐ yes (explain below) ☒ no

$a_1 = 0.5^\circ (<10^\circ)$, $a_2 = 1^\circ (<10^\circ)$, $z = A \sin g = 0.025$ (in.); (<0.125 in.)
 $b_1 = 2^\circ (<5^\circ)$, $b_2 = 0^\circ (<5^\circ)$, $w = A \sin q = 0.025$ (in.); (<0.03125 in.)
 $\gamma = 1.5^\circ$, $\theta = 1.5^\circ$, $A = 0.964$ (in.), $P_A = 0.482$ (in.), $P_B = 0.482$ (in.), $D_t = 0.375$ (in.)

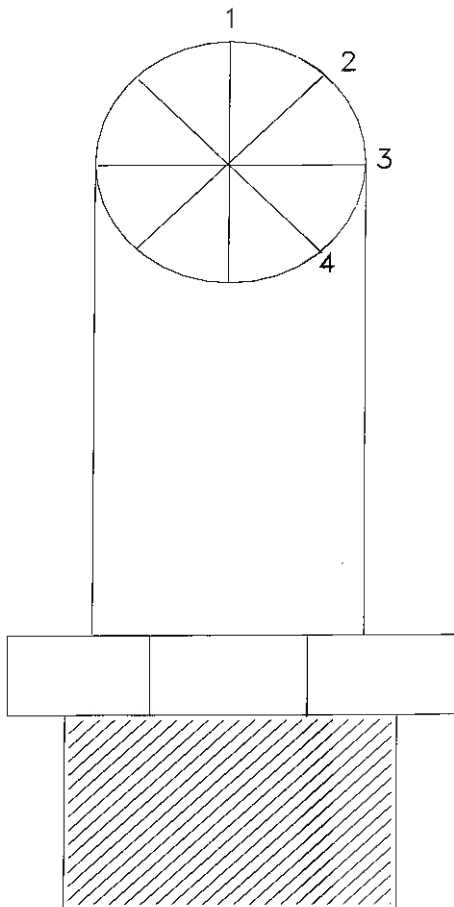
Calibration required? ☐ yes ☒ no

Nozzle Calibration

Date: 8/13/2015

Nozzle ID No.: T-24

Analyst: SD



0.494 1

0.494 2

0.492 3

0.494 4

Average
<u>0.494</u>

WEIGHING
SOLUTIONS
INC.

SALES-SERVICE-RENTALS
3310-14 N. HARLEM AVENUE
CHICAGO, IL 60634

PHONE
773-836-2800
FAX
773-836-2891

CALIBRATION REPORT

Company Name MOSTARDI PLATT
Date OCTOBER 14, 2015
Location LAB
Weight Set # E559

Model # E 0648
Serial/ID # 6045121051238
Manufacturer OHAUS
Tolerance ± 0.05%

Capacity 62g
Readability 0.1mg
Weight # 1 0.1mg
Weight # 2 1g
Weight # 3 10g
Weight # 4 20g
Weight # 5 50g

Before Cal.:

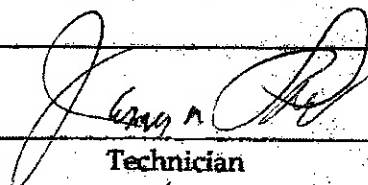
0.0001g
1.0000g
10.0000g
20.0002g
50.0005g

After Cal.:

0.0001g
1.0000g
10.0000g
20.0000g
50.0000g

	Accept	Reject
Linearity	<u>✓</u>	<u> </u>
Cornerload	<u>✓</u>	<u> </u>
Repeatability	<u>✓</u>	<u> </u>
Hysteresis	<u>✓</u>	<u> </u>

Comments Cleaned and adjusted calibration to N.I.S.T. specifications.


Technician
678
State Of IL Registration



State of Illinois



Department of Agriculture

Registration Number: 1604

Expires: 02/28/2016

Bureau of Weights and Measures

Registered Service Company Certificate of Registration

This is to certify that the named company has met all requirements
for registration with this office for weighing devices.

A handwritten signature in cursive script, likely belonging to the Bureau Chief.

**Bureau Chief
Bureau of Weights & Measures**

Issued To:

**WEIGHING SOLUTIONS, INC.
3310-14 N HARLEM AVE
CHICAGO, IL 60634**

Pre/Post	Date	Time	Analyst	Ambient Temperature degrees F	Relative Humidity %	Barometric Pressure inches Hg	Calibration Standard 50.0000g	% Error	Calibration Standard 5.0000g	% Error	Calibration Standard 0.5000g	% Error
Pre	10/5/2015	8:00 AM	JLS	69	34.0	29.50	49.9997 g	0.00	4.9999 g	0.00	0.5001 g	-0.02
Post	10/5/2015	3:30 PM	JLS	72	33.0	29.50	49.9997 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Pre	10/6/2015	7:30 AM	JLS	69	36.0	29.47	49.9998 g	0.00	5.0000 g	0.00	0.5003 g	-0.06
Post	10/6/2015	3:00 PM	JLS	73	33.0	29.50	49.9995 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Pre	10/7/2015											
Post	10/7/2015											
Pre	10/8/2015											
Post	10/8/2015											
Pre	10/9/2015											
Post	10/9/2015											
Pre	10/12/2015	7:00 AM	JMG	70	28.0	29.08	49.9996 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Post	10/12/2015	3:00 PM	JMG	70	28.0	29.00	49.9995 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Pre	10/13/2015	8:00 AM	JMG	70	25.0	29.00	49.9998 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Post	10/13/2015	3:00 PM	JMG	70	25.0	29.00	49.9998 g	0.00	5.0000 g	0.00	0.5000 g	0.00
Pre	10/14/2015	8:00 AM	JMG	67	26.0	29.26	49.9998 g	0.00	5.0000 g	0.00	0.5001 g	-0.02
Post	10/14/2015	2:30 PM	JLS	70	24.0	29.35	49.9993 g	0.00	4.9999 g	0.00	0.5003 g	-0.06
Pre	10/15/2015	7:00 AM	JMG	69	25.0	29.32	49.9998 g	0.00	4.9999 g	0.00	0.5001 g	-0.02
Post	10/15/2015	1:30 PM	JMG	69	25.0	29.32	49.9998 g	0.00	4.9999 g	0.00	0.5001 g	-0.02
Pre	10/16/2015	8:00 AM	JLS	66	24.0	29.53	49.9994 g	0.00	5.0000 g	0.00	0.5004 g	-0.08
Post	10/16/2015	2:30 PM	JLS	68	24.0	29.62	49.9991 g	0.00	5.0001 g	0.00	0.5000 g	0.00
Pre	10/19/2015											
Post	10/19/2015											
Pre	10/20/2015	8:00 AM	JMG	70	23.0	29.41	50.0001 g	0.00	5.0000 g	0.00	0.5002 g	-0.04
Post	10/20/2015	9:00 AM	JMG	70	23.0	29.41	50.0001 g	0.00	5.0000 g	0.00	0.5002 g	-0.04
Pre	10/21/2015	9:00 AM	JMG	69	26.0	29.44	49.9999 g	0.00	5.0002 g	0.00	0.5002 g	-0.04
Post	10/21/2015	10:00 AM	JMG	70	25.0	29.44	49.9999 g	0.00	5.0002 g	0.00	0.5002 g	-0.04
Pre	10/22/2015	2:00 PM	JMG	68	24.0	29.50	49.9999 g	0.00	5.0001 g	0.00	0.5002 g	-0.04
Post	10/22/2015	2:15 PM	JMG	68	24.0	29.50	49.9999 g	0.00	5.0001 g	0.00	0.5002 g	-0.04
Pre	10/23/2015	8:00 AM	JMG	68	27.0	29.56	49.9999 g	0.00	5.0001 g	0.00	0.5000 g	0.00
Post	10/23/2015	3:00 PM	JMG	68	28.0	29.56	49.9999 g	0.00	5.0001 g	0.00	0.5000 g	0.00

Balance IC OHAUS Model Explorer
GO451121051238

Appendix H - Gas Cylinder Certifications

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI59E15A3452	Reference Number:	54-124361680-5
Cylinder Number:	CC55028	Cylinder Volume:	159.0 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12013	Valve Outlet:	590
Gas Code:	CO2,O2	Certification Date:	Feb 25, 2013

Expiration Date: Feb 25, 2021

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e., 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	19.00 %	18.63 %	G1	+/- 1.4% NIST Traceable	02/25/2013
OXYGEN	22.00 %	21.96 %	G1	+/- 0.7% NIST Traceable	02/25/2013
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM/CO2	06120405	CC184974	19.66 % CARBON DIOXIDE/NITROGEN	+/- 0.5%	May 01, 2016
NTRM/O2	06120202	CC195927	20.9 % OXYGEN/NITROGEN	+/- 0.4%	Dec 01, 2015

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Jan 28, 2013
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Feb 20, 2013

Triad Data Available Upon
Request

Notes:

Approved for Release

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI78E15A1066	Reference Number:	54-124500021-7
Cylinder Number:	CC89223	Cylinder Volume:	151.1 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12015	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Jun 23, 2015

Expiration Date: Jun 23, 2023

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	9.926 %	G1	+/- 1.0% NIST Traceable	06/23/2015
OXYGEN	12.00 %	11.98 %	G1	+/- 1.0% NIST Traceable	06/23/2015
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	06120402	CC184369	19.66 % CARBON DIOXIDE/NITROGEN	+/- 0.5%	May 01, 2016
NTRM	06120204	CC195893	20.90 % OXYGEN/NITROGEN	+/- 0.4%	Dec 01, 2015

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Jun 12, 2015
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Jun 16, 2015

Triad Data Available Upon Request



Approved for Release

Page 1 of 54-124500021-7

END OF THE REPORT



**Emission Test Report
Particulate and Metals Emissions
Behr Iron & Metal - Rockford, Illinois
Site ID No.: P201030AB**

January 19, 2016

**APPENDIX E
METHOD 29 AUDIT SAMPLE REPORT**

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A Waters Company

October 30, 2015

John Pinion
Behr Iron And Metal
1100 Seminary St
Rockford, IL 61104

Enclosed is your final report for ERA's Stationary Source Audit Sample (SSAS) Program. Your final report includes an evaluation of all results submitted by your laboratory to ERA.

Data Evaluation Protocols: All analytes in ERA's SSAS Program have been evaluated comparing the reported result to the acceptance limits generated using the criteria contained in the TNI SSAS Table.

For any "Not Acceptable" results, please contact your state regulator for any corrective action requirements.

Thank you for your participation in ERA's SSAS Program. If you have any questions, please contact our Proficiency Testing Department at 1-800-372-0122.

Sincerely,

David Kilhefner
Quality Officer

cc: Project File Number 092915O



A Waters Company

Recipient Type	Report Recipient	Contact	Project ID
Agency	IL-EPA Region 5 (SSAS) 77 W Jackson Blvd AE-17J Chicago, IL 60604 USA	Dakota Prentice prentice.dakota@epa.gov Phone: 312-886-6761	
Facility	Behr Iron And Metal 1100 Seminary St Rockford, IL 61104 USA	John Pinion jpinion@rka-inc.com Phone: 630-393-9000	
Lab	Maxxam Analytics Inc 6740 Campobello Rd Mississauga, ON L5N 2L8 Canada	Clayton Johnson Sr. Project Manager cjohnson@maxxam.ca Phone: (905) 817-5769	
Tester	Mostardi Platt 888 Industrial Drive Elmhurst, IL 60123 USA	Jenna Ghanma jghanma@mp-mail.com Phone: 630-993-2685	Behr M154005





A Waters Company

092915O Laboratory Exception Report

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

Evaluation Checks

There are no values reported with < where the assigned value was greater than 0.

Not Acceptable Evaluations

There were no Not Acceptable evaluations for this study.

E-3



Final Report Results For Laboratory Maxxam Analytics Inc

E-4



SSAP Evaluation Report

Project Number: **092915O**

ERA Customer Number: **M748564**

Laboratory Name: **Maxxam Analytics Inc**

Inorganic Results





A Waters Company

092915O Evaluation Final Complete Report

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
------------------	---------	-------	----------------	----------------	-------------------	------------------------	--------------------	---------------	--------------

SSAP Metals on Filter Paper (cat# 1425, lot# 092915O) Study Dates: 09/29/15 - 10/30/15

1005	Antimony	µg/Filter	32.2	31.9	23.9 - 39.9	Acceptable	EPA Method 29 2000	10/28/2015	
1010	Arsenic	µg/Filter	26.4	27.3	20.5 - 34.1	Acceptable	EPA Method 29 2000	10/28/2015	
1015	Barium	µg/Filter	31.4	27.2	20.4 - 34.0	Acceptable	EPA Method 29 2000	10/28/2015	
1020	Beryllium	µg/Filter	12.5	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1030	Cadmium	µg/Filter	13.2	13.6	10.9 - 16.3	Acceptable	EPA Method 29 2000	10/28/2015	
1040	Chromium	µg/Filter	21.0	20.4	16.3 - 24.5	Acceptable	EPA Method 29 2000	10/28/2015	
1050	Cobalt	µg/Filter	14.6	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1055	Copper	µg/Filter	14.2	13.6	10.2 - 17.0	Acceptable	EPA Method 29 2000	10/28/2015	
1075	Lead	µg/Filter	27.4	27.2	21.8 - 32.6	Acceptable	EPA Method 29 2000	10/28/2015	
1090	Manganese	µg/Filter	14.5	13.6	9.52 - 17.7	Acceptable	EPA Method 29 2000	10/28/2015	
1105	Nickel	µg/Filter	27.1	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	
1140	Selenium	µg/Filter	26.9	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	
1150	Silver	µg/Filter	40.8	40.8	28.6 - 53.0	Acceptable	EPA Method 29 2000	10/28/2015	
1165	Thallium	µg/Filter		40.8	30.6 - 51.0	Not Reported			
1190	Zinc	µg/Filter	29.0	27.2	19.0 - 35.4	Acceptable	EPA Method 29 2000	10/28/2015	

E-6





A Waters Company

092915O Evaluation Final Complete Report

Clayton Johnson
Sr. Project Manager
Maxxam Analytics Inc
6740 Campobello Rd
Mississauga, ON L5N 2L8
(905) 817-5769

EPA ID:
ERA Customer Number:

Not Reported
M748564

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
------------------------	---------	-------	-------------------	-------------------	----------------------	---------------------------	--------------------	------------------	--------------

SSAP Metals in Impinger Solution (cat# 1426, lot# 092915O) Study Dates: 09/29/15 - 10/30/15

1005	Antimony	µg/mL	1.78	1.70	1.28 - 2.12	Acceptable	EPA Method 29 2000	10/27/2015	
1010	Arsenic	µg/mL	0.902	0.895	0.671 - 1.12	Acceptable	EPA Method 29 2000	10/27/2015	
1015	Barium	µg/mL	1.10	1.05	0.788 - 1.31	Acceptable	EPA Method 29 2000	10/27/2015	
1020	Beryllium	µg/mL	1.45	1.35	1.01 - 1.69	Acceptable	EPA Method 29 2000	10/27/2015	
1030	Cadmium	µg/mL	1.17	1.12	0.896 - 1.34	Acceptable	EPA Method 29 2000	10/27/2015	
1040	Chromium	µg/mL	2.51	2.42	1.94 - 2.90	Acceptable	EPA Method 29 2000	10/27/2015	
1050	Cobalt	µg/mL	1.96	1.75	1.31 - 2.19	Acceptable	EPA Method 29 2000	10/27/2015	
1055	Copper	µg/mL	1.29	1.22	0.915 - 1.52	Acceptable	EPA Method 29 2000	10/27/2015	
1075	Lead	µg/mL	0.719	0.695	0.521 - 0.869	Acceptable	EPA Method 29 2000	10/27/2015	
1090	Manganese	µg/mL	0.343	0.326	0.244 - 0.408	Acceptable	EPA Method 29 2000	10/27/2015	
1105	Nickel	µg/mL	0.372	0.357	0.286 - 0.428	Acceptable	EPA Method 29 2000	10/27/2015	
1140	Selenium	µg/mL	1.81	1.80	1.35 - 2.25	Acceptable	EPA Method 29 2000	10/27/2015	
1150	Silver	µg/mL	0.878	0.818	0.614 - 1.02	Acceptable	EPA Method 29 2000	10/27/2015	
1165	Thallium	µg/mL		1.59	1.19 - 1.99	Not Reported			
1190	Zinc	µg/mL	1.74	1.64	1.23 - 2.05	Acceptable	EPA Method 29 2000	10/27/2015	

E-7



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